JANUARY 21, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

1957

1956

1955

1954

Numerical Control's Big Year in Machine Tools

Large and small plants will profit from tape and card versatility . . . page 68

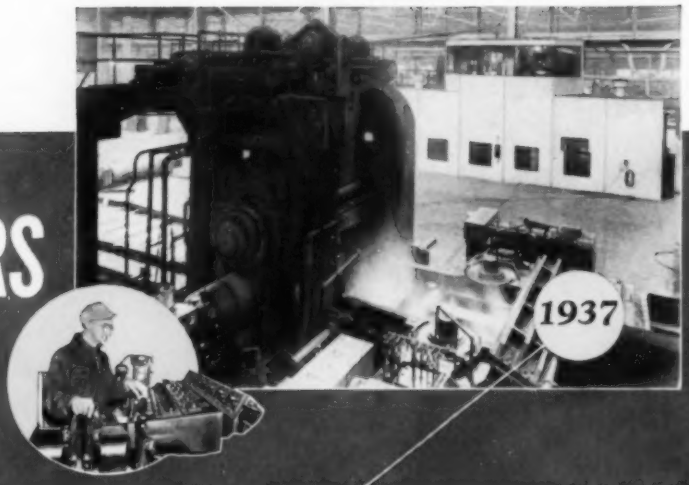
✔ Tight Credit: Its Daily Effects —page 35

✔ Big Pipe Booked Into 1960 —page 105

CONTENTS — PAGE 5

20 YEARS OF EC&M DESIGN LEADERSHIP!

IN AUTOMATIC-POSITIONING SCREWDOWN CONTROL



20 YEARS AGO, EC&M Automatic-Positioning Screwdown Control was installed in this mill. It has been doing an outstanding job ever since.

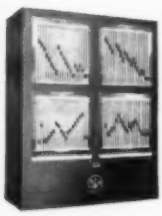
Since then, this same basic EC&M system has been installed in nearly 50 other mills—including blooming mills, billet mills, beam mills, plate mills and reversing roughers ahead of hot strip mills.

Now, this same proven system has been expanded to provide programming either by punched cards or by slider panels—for new or existing installations, operated from either constant or adjustable voltage.

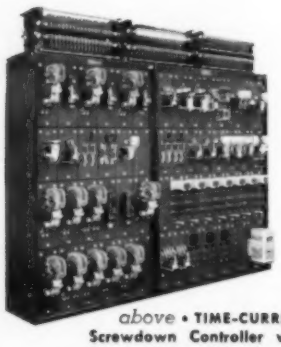
1957

PROGRAMMING NOW AVAILABLE BY PUNCHED CARDS OR SLIDER PANELS

at left • **Punched Card Reader automatically signals roll setting for each pass**



at right • **Slider Panel provides roll settings for 2 complete schedules. Pistol grip switch provides immediate transfer from one to the other**



above • **TIME-CURRENT Screwdown Controller with Magnetic Amplifier Control and Relay Panel**

EC&M DESIGN ADVANTAGES

A single pushbutton controls the most important operation in rolling. Screwdown rolls accurately set for each pass. No schedule to remember.

Ability to change from automatic to manual and back again, instantly available to the roller.

EC&M system is direct reading. No coding and de-coding requiring multiplicity of relays.

Easily serviced by regular maintenance crew. Simple adjustment for roll changes.

Over 900 roll positions obtainable from only 2 small (main and vernier) face-plate, positioning switches.

New operators quickly trained.

They all add up to GREATER TONNAGE— ACCURACY— QUALITY

for the complete story, write for Booklet 9250-PS

THE ELECTRIC CONTROLLER & MFG. CO.

A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 • OHIO

7930

XIX

This is the nineteenth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Determining the Proper Depth of Case in Alloy Steels

In the previous article of this series we discussed the carburizing of alloy steels, pointing out that the purpose of carburizing is to provide a hard, abrasion-resistant outer shell or "case." Such a discussion naturally gives rise to the question, What factors influence the choice of case? Should it be shallow? Medium? Deep or extra-deep?

While it is not always wise to formulate hard-and-fast rules, the following may be used as a general yardstick:

Shallow cases (less than 0.02 in.). Suitable where wear-resistance alone is the chief requirement, and where good surface condition after heat-treating is advantageous. Not suitable if high stresses are apt to be encountered in service.

Medium cases (0.02 to 0.04 in.). For high wear-resistance. Will stand up under substantial service loads and stresses. The thickness is sufficient to permit certain finishing operations, such as light grinding.

Medium-to-deep cases (0.04 to 0.06 in.). For high wear-resistance. A case in this depth range is essential where continuing friction is involved, especially friction of an abrasive or semi-abrasive nature. It is also a good precautionary measure where application of the finished part may sometimes involve crushing action.

Extra-deep cases (more than 0.06 in.). Cases of this depth can be obtained by extending the furnace time in pack carburizing. Highly wear-resistant, they also withstand shock and impact. A large camshaft of an internal-combustion engine is a good example of a part requiring the extra-deep case. This is of course particularly true of the cam lobes themselves.

If you require specific advice concerning case-hardened parts, by all means communicate with our Metallurgical Division. Bethlehem technicians are always on call, and you can depend on their recommendations. And you can depend on Bethlehem, too, when seeking new supplies of alloy steels; for Bethlehem makes the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

If you would like reprints of this series of advertisements from No. I through No. XVI please write to us, addressing your request to Publications Dept., Bethlehem Steel Company, Bethlehem, Pa. The first 16 subjects in the series are now available in a handy 32-page booklet, and we shall be glad to send you a free copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

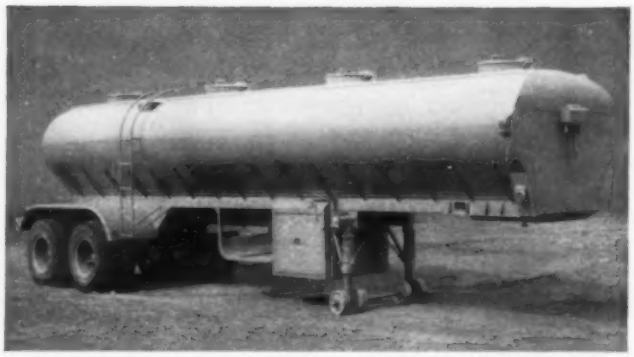
BETHLEHEM STEEL

Yoloy "E" Makes Lighter Trailers

Yoloy "E" containing nickel, copper and chromium, a Member of the Yoloy Family of Steels, having a longer life, greater strength and good weldability makes Trailer tanks more durable and stronger. This new style tank is brought about by the use of lighter gauges plus the elimination of certain structures formerly required, plus reshaping and reforming the skin. The result is a tank that is serviceable, strong yet lighter.

Write for these free pamphlets in The Yoloy Family series:

Yoloy "E"	High Strength Low Alloy Steel-standard applications
Yoloy	High Strength Low Alloy Steel-special applications
Yoloy "S"	Higher Strength Steel for increased service life
Yoloy "C"	Corrosion Resistant Grade for deep forming
Yoloy Pipe	Continuous Weld for corrosion resistant applications



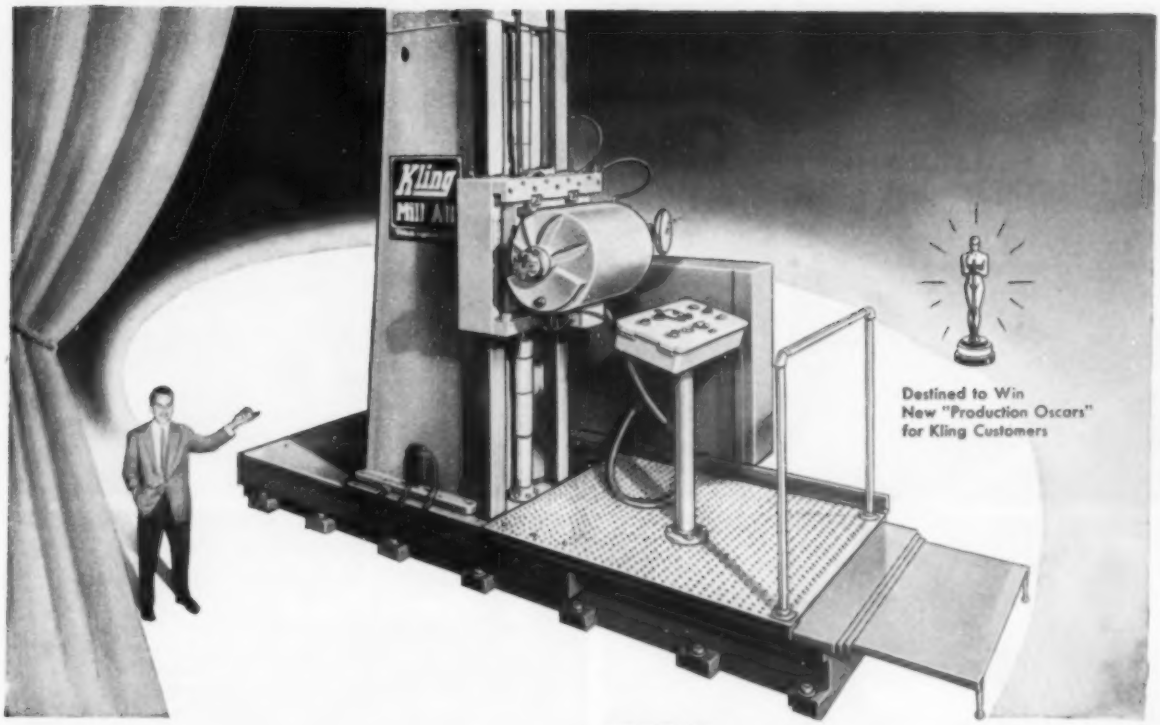
Independent Metal Products Div. of Fruehauf Trailer Co. produced (above) a new style 6250 gallon tank weighing approximately 1100 lbs. less than a 6000 gallon tank made of conventional steel and (right) a new style cement hauler saving as much as 300 lbs.

QUALITY YOUNGSTOWN SERVICE

THE Youngstown SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

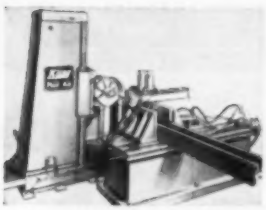
Producers of Quality Carbon and Alloy Steels for Over Half-a-Century



Destined to Win
New "Production Oscars"
for Kling Customers

the New Kling MILL-ALL

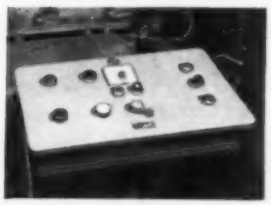
...does more facing jobs faster and at lower cost!



Mill-All with Work Table
and Hydraulic Holding Devices.

This new high speed face milling machine has proven, in daily operation, every claim made for it for faster removal of metal from any structural shape, plate or fabrication. It offers exceptional power and capacity, is simply designed, easy to operate and enduringly built, as demonstrated by this partial list of construction details:

- ✓ *Primary construction of machine is welded steel.*
- ✓ *Vertical feed screw is protected by telescoping tubular brass covers.*
- ✓ *Non-metallic ways are used on both the horizontal and vertical ways.*
- ✓ *Telescoping steel covers are used to protect the horizontal ways.*
- ✓ *Motor is mounted on a slide which provides for 10 inches of in-and-out travel of the cutter.*



Operator Control Panel

How this new machine Outperforms all others; Compare on these points with machines you are now using

Some of its jobs	Feed Rates	Metal Removal Rate	Horiz. Cutter Travel	Vert. Cutter Travel	Motors	
Faces structural steel beams and columns and other steel sections and fabrications. Faces steel and iron castings, forgings, weldments, die blocks, etc. Does plate edging; can chamfer plates and bars (tilting head model) and can be adapted to mill aluminum and other nonferrous metals.	(Horiz. and Vert.) 40" and 80" per min.	Up to 60 cu. in. per min.	4 sizes 72" to 144"	3 sizes 60" to 84"	3 H.P. Horiz. and Vert. Gear Head Feed Motors with Brake	40 H.P. Spindle Motor Direct Drive 75 H.P. also available

For further details call your nearest Kling Distributor. Active Kling Distributors cover practically every marketing area of U.S. and Canada. Write us for name of one nearest you.

Since 1892

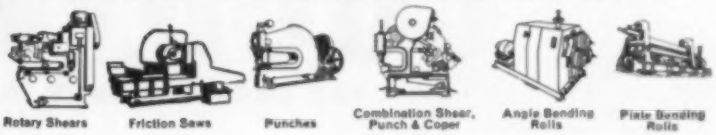
KLING BROS. ENGINEERING WORKS

1320 N. KOSTNER AVE. • CHICAGO 51, ILL.

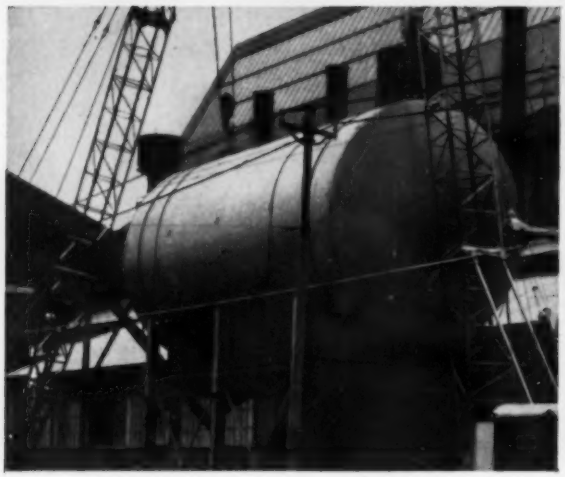
Exclusive Canadian Distributor: Brown-Boggs Foundry & Machine Co. Ltd., Hamilton, Ont.
Export Distributor: Simmons Machine Tool Corp., 50 E. 42nd St., New York 17, New York

Kling

1153R



Rotary Shears | Friction Saws | Punches | Combination Shear, Punch & Coper | Angle Bending Rolls | Plate Bending Rolls



GOODYEAR INDUSTRIAL PRODUCTS

GTM - **Specified** Typical Uses for PLIOWELD

(corrosion-resistant rubber lining or covering)

- Tanks—rectangular, round, square, open top, flat or dished heads
- Tank Covers—flat, box, radius types
- Truck Tanks
- Tank Barges
- Railroad Tank Cars
- Fans—blades, wheels, housings
- Flanged Pipe and Fittings
- Fume Hoods and Ducts
- Scrubbers and Towers
- Air Purifiers
- Agitators
- Troughs and Chutes
- Continuous Vacuum Filters
- Pumps
- Filter Frames
- Miscellaneous Fabricated Items

PLIOWELD can also be used to combat abrasion

G.T.M. completes another "turn-key" tank lining job

FOR stream pollution abatement, an eastern steel mill needed a number of big tanks to collect and treat waste pickle liquor—four 45,000-gal. storage tanks, three 41,000-gal. storage and leaching tanks, and five smaller tanks.

The G.T.M.—Goodyear Technical Man—recommended lining the tanks with PLIOWELD—especially compounded corrosion- and abrasion-resistant rubber. He also agreed to handle the complete job "from blueprints to saddles." This included procurement of tanks, lining at fabricator's plant, and movement by barge and truck to customer's plant. And this involved hiring movers and equipment, obtaining rights of way, moving telephone and electrical wires, making police and traffic arrangements.

The net result was a "turn-key" job, delivered as ordered, with no problems for the customer. Like to have your lining job handled the same way? Just turn it over to the G.T.M.! Contact him through your Goodyear Distributor, or write Goodyear, Industrial Products Division, Akron 16, Ohio.

PLIOWELD TANK LININGS by

GOODYEAR

THE GREATEST NAME IN RUBBER

Plioweld—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

IN THIS ISSUE

STEEL
The Metalworking Weekly

January 21, 1957
Vol. 140 No. 3

METALWORKING OUTLOOK

29 **Road program spending to hit $50 billion before 1972.** Federal share will be $33.8 billion

☑ 35 **Tight credit:** No big problem yet for day-to-day business

36 **Federal budget rules out any tax cut this year**—Spending for hard goods will rise

37 **Scrap men predict heavy demand in '57;** record set in '56

37 **Steel expansion and replacement** costs up 42 per cent this year

38 **Budd Co. diversifies** into nuclear business

39 **Continental Gin Co. expands** and diversifies

☑ 40 **Sales territories:** How and when to set and change them

47 **Gains Ahead in Cutting Tools**—Sales to hit $135 million in 1957

TECHNICAL OUTLOOK

67 **First Zircoloy tubing being made for an atomic reactor**—It will go into installation at Shippingport, Pa.

COVER ARTICLE

68 **Machines That Obey Orders**—Tapes and cards will make machine tool versatility attractive to large and small plants

73 **Three Ways To Cut Brazing Costs**—Outlined by tubular assembly maker

74 **Punch Card System Used for Rolling Mill**—Insures uniform quality

☑ 76 **Progress in Steelmaking**—Pipe mill is electronically controlled

82 **Deburring Is Precision Process**—Time savings over hand methods at Ford's aircraft plant in Chicago are enormous

88 **Dry hearth melting furnace for soft metal** saves $350 a month

90 **Copper Wire Has Steel Core**—Promises economies in communications

MARKET OUTLOOK

103 **Steel Sellers Must Push**—Indexes and composites, 113; steel prices, 115; ores, 123; ferroalloys, 124; scrap trends, 126, prices, 128

☑ 105 **Big Pipe Is Booked Into '60**—This is farther than any other steel mill product. Even plates and structurals aren't booked that far

130 **Nonferrous Metals**—Nicaro Production Poses Problem—Prices, 132

REGULAR FEATURES

6 Behind the Scenes
10 Letters to The Editors
16 Staff Listing
23 Calendar of Meetings
33 The Editor's Views
42 Windows of Washington
45 Management at Work
49 Mirrors of Motordom
53 The Business Trend
57 Men of Industry
62 Obituaries
93 New Products
99 New Literature
135 Advertising Index

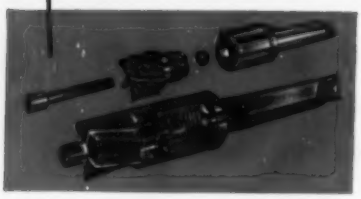
Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscriptions in the U.S. and possessions and Canada, $10 a year; all other countries, $20. Current issues, 50 cents each. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1957, The Penton Publishing Co.

Index available semi-annually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

Continental

Counterbore Sets Save Your Time— Save Your Tools

A Twist of the Wrist engages or releases the cutters. Double lugs on cutter engage double abutments in holder. Double aligning bearings for rigidity.



Phantom view shows the strong, rigid drive for quick interchangeability of tools.

CONTINENTAL has three STANDARD COUNTERBORE SETS for your selection. They are toolroom favorites. WRITE FOR CATALOG and prices.

CTW

CONTINENTAL TOOL WORKS

Division of Ex-Cell-O Corporation Detroit 32, Michigan

behind the scenes

Conference in Reverse

As chairman of the board, U.S. Steel Corp., Roger Blough is the natural prey of reporters. Each December, however, he turns the tables on the financial and business press: He hosts an annual luncheon for business writers in the U.S. Steel Corp.'s private dining room at 71 Broadway, New York, and does all the questioning himself. Editor-in-Chief Irwin Such and Eastern Editor Ben Price, who were invited to represent STEEL at Mr. Blough's luncheon, report that the questions submitted by the board chairman were as analytical as they were incisive.

Twenty-two of 26 people thought that business inventories would increase during the first half of 1957; a similar proportion did not consider that the discount rate of any Federal Reserve Bank would be lowered below 3 per cent; opinion was evenly divided on whether or not the gross national product would rise to $435 billion in the first half of 1957.

On the lighter side, Leslie Gould, financial editor of the *New York Journal-American*, contributed some provocative definitions of business cliches. A policy: Common substitute for good judgment. Merger: A form of musical chairs in which one or more executives are left without a seat. Capital gain: The substance executive dreams are made of. Before taxes: Wishful thinking.

Mr. Blough's annual luncheon for business writers has come to be a heady and instructive affair, and if he ever cared to make a report of his findings there isn't an editor alive who wouldn't be willing to trade a gold tooth for each paragraph.

Bell for Facts & Figures

Associate Managing Editor Vance Bell recently honored us by appearing outside our coop and uttering an impressive "How!" Following a brisk exchange of amenities, Mr. Bell called our attention to the fact that the concise and completely admirable section of STEEL's Yearbook, "Metalworking Facts and Figures," is available to readers in reprint form —and at no charge.

This 48-page insert represents the ninth annual edition of "Metalworking Facts and Figures," and lists all the figures you need on production, sales, labor, prices and earnings, etc. Also available are free reprints of "Metalworking's Fabulous Future," and "What Metalworking Management Expects." If any of your folks want 'em, just write in (for single copies), and say SHRDLU sent you.

Tape Measuring Production

Say, that tape business on the front cover is really something. Talk about living in the world of tomorrow! Think of feeding a tape into a machine, and then sitting back to watch the machine huff and puff and cough up intricately machined parts by the hundred or by the million. The story on page 68 reveals that 1957 will see a tremendous rise in tape controlled machines. Throw a perforated paper roll into a player piano, and out comes "Over the Waves." Throw a perforated roll into a tape controlled machine, and out comes "Over the hump, or how we got into the profit column by producing dandy parts with faster setups for short runs on our handy little tape controlled gizmo."

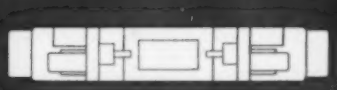
Gwendolyn by a Fluke

There were two answers to the clock puzzle: 2:18 6/13 and 2:43 7/11. Quickest replies came from Myron Bowerman, Alliance Machine Co., Alliance, O.; Robert Wells, Great Falls, Mont.; E. K. Chapman, Hy-Pro Tool Co., New Bedford, Mass.; K. Moburg, Ideal Industries, Sycamore, Ill. We received other communications, which we shall take up later. In the meantime our sixth grade readers have been complaining, so here's a simple one: A lazy whale named Gwendolyn swims 13½ miles per hour in still water. She makes a straight run with the tide for 1 hour and 8 minutes—probably looking for smoked squid. Her return trip against the tide takes 8 minutes longer, so what do you suppose is the average force of the tide?

Shrdlu

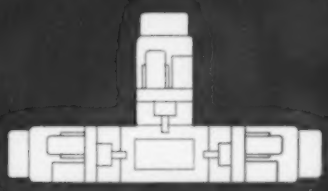
(Metalworking Outlook—Page 29)

ONE WAY

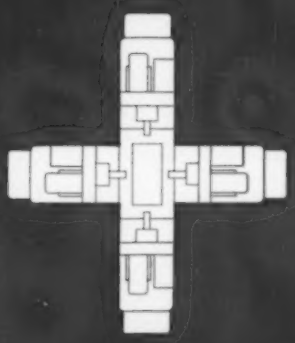


TWO WAYS AT 180°

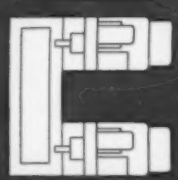
TWO WAYS AT 90°



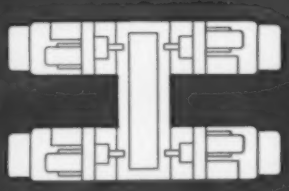
THREE WAYS



FOUR WAYS



MULTI-WAYS



MULTI-WAYS

Ex-Cell-O 4-Way Machine precision bores four holes simultaneously, holding 90° angles.

7 ways to increase your production

Three new features on all Ex-Cell-O Way Machines give even greater production and precision

The diagrams at left tell a story.

Ex-Cell-O Way Machines using standard components in the combinations illustrated perform precision boring, turning, facing, grooving and chamfering operations economically and quickly. They take large work pieces in stride—the spindles move to the work.

In each machine three new features assure long life, dependable operation, and exceptional accuracy.

The features: (1) ways are hardened and ground, (2) slides are fully supported the length of the stroke, (3) hydraulic control panels give a wide range of automatic cycles.

Write Ex-Cell-O in Detroit for further information. Better still, call in an Ex-Cell-O representative.

EX-CELL-O CORPORATION

EX-CELL-O FOR PRECISION

XLO

DETROIT 32, MICHIGAN • Manufacturers of Precision Machine Tools • Grinding Spindles • Cutting Tools • Railroad Pins and Bushings • Drill Jig Bushings • Aircraft and Miscellaneous Production Parts • Dairy Equipment

58-44

IN JAPAN

NEW Bliss reversing mill doubles in sheet steel and tin plate

This new four-high reversing mill at Yodogawa Steel Works is another example of how Bliss can engineer equipment to meet a special operating need. This ability...and the policy from which it stems... are important reasons why Bliss has grown to be a leading builder of rolling mills and mill equipment in little more than a quarter of a century.

Dual roll coolant systems make it possible for Yodogawa to roll either steel sheet or tin plate. The two systems provide a quick, easy change-over from the water soluble oil solution needed for sheet products to palm oil for tin plate products.

The mill itself is a 16″ and 53″ by 54″ capable of rolling strip up to 48″ in width at a maximum speed of 2012 feet per minute. The tension reels of its coil handling equipment can accommodate 20″ I.D. by 56″ O.D. coils weighing 30,000 pounds. The work rolls are alloy forged steel, while the backing rolls are Technalloy steel cast by Bliss' Mackintosh-Hemphill Division.

To gain an idea of what Bliss can do to help solve your particular rolling problem, write us today for a free copy of our 60-page Rolling Mill Brochure, Catalog 40-A.

E. W. BLISS COMPANY
General Office: Canton, Ohio
ROLLING MILL DIVISION
SALEM, OHIO

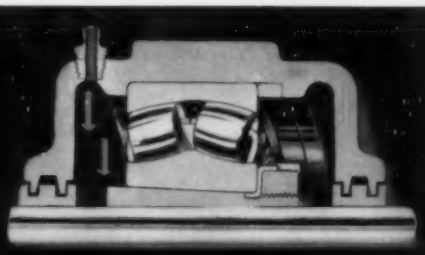
PLANTS: Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Pittsburgh and Midland, Pennsylvania; San Jose, California. *In Europe:* E. W. Bliss (England) Ltd., Derby; E. W. Bliss Co. (Paris), France.

BLISS
SINCE 1857

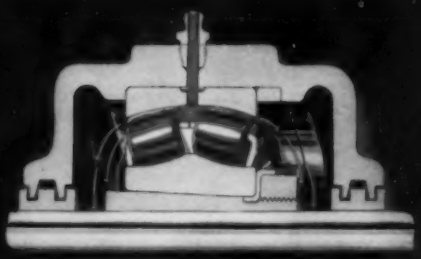
is more than a name... it's a guarantee

At No Extra Charge ...A MAJOR IMPROVEMENT

IN LUBRICATING SPHERICAL ROLLER BEARINGS



Originally, lubricant entered the bearing housing via a fitting in the side of the housing cap. Flow path was through the bearing.



NOW, the lubricant is introduced through a fitting in the center of the housing cap and moves along a groove that is machined around the circumference of the outer ring. Equally spaced holes drilled in the ring permit the lubricant to enter the center of the bearing.

Nobody but SKF Offers This to You on Spherical Roller Bearings

Once again **SKF** offers another important innovation in spherical roller bearing design. Available in spherical roller bearings 140 mm (5.5118") O.D. and larger, this feature represents a still further improvement to the proven **SKF** Type "C" Spherical Roller Bearing.

The new design allows the lubricant to enter at the *center* of the bearing and move outwardly – completely covering all working surfaces. Old lubricant is flushed away from the bearing and, with it, any abrasive dust, dirt, moisture, or other impurities.

You can use this improved bearing in your existing housings simply by moving the lubrication fitting to the center.

Here again is an example of how **SKF** helps you to obtain longer bearing life, at no added cost. Send for Bulletin No. 443 for complete details. 7781

SKF®

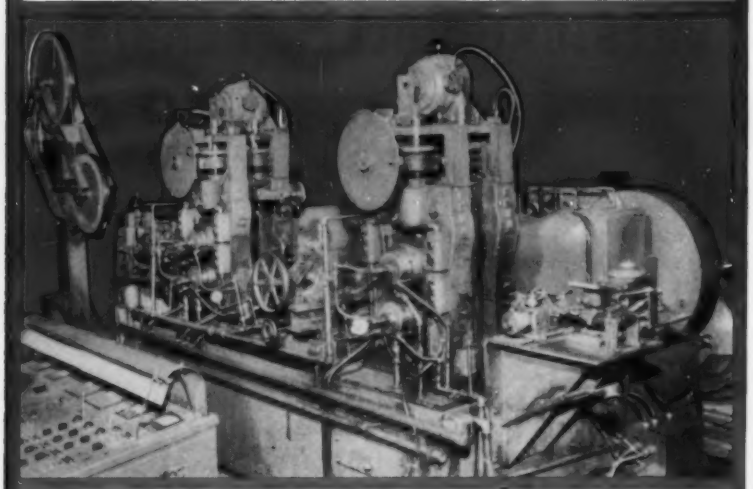
EVERY TYPE—EVERY USE

Ball Bearings
Cylindrical Roller Bearings
Spherical Roller Bearings
Tapered Roller Bearings ("Tyson")

*Reg. U.S. Pat. Off. Tyson Bearing Corporation

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

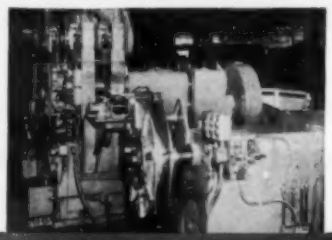
ROLLING WIRE AT 1200 FPM



THIS Fenn Model 082 Tandem Rolling Mill is in operation at the Continental Steel Corporation, Kokomo, Indiana, and is an excellent example of modern, high speed, precision wire flattening. With this mill, Continental reports production speeds of 400 FPM to 1200 FPM. Wire sizes run ranged from 0.5 in. x .130 in. at 1600 lbs., per hour down to .197 in. x .024 in. at 600 lbs., per hour.

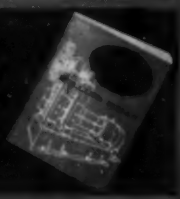
In addition to its precision operation and compactness the Model 082 mill features a one piece bed, automatic loop regulator, power screw-downs, friction-driven edger, electronic gaging, and hydraulically traversing take-up reel.

Whatever your requirements for rolling ferrous and nonferrous metals in sheets, strips, wire or rod, it will pay you to investigate the Fenn line of Precision Rolling Mills. Fenn engineering service is available at all times to help you solve any rolling problem.



FENN

SEND FOR NEW FENN ROLLING MILL CATALOG



Precision Rolling Mills

Turks Heads

Wire Shaping Mills

Swaging Machines

Wire and Tube Drawing Machines

THE FENN MANUFACTURING COMPANY, 406 FENN ROAD, NEWINGTON, CONN.

LETTERS
TO THE EDITORS

Fabulous Future: Impressive

The article, "Get Set for Metalworking's Fabulous Future" (Jan. 7, page 123) was very impressive. It would be appreciated if we could have nine reprints for distribution to our various district sales offices located throughout the U.S.

C. J. Brunn
Manager of Sales
Stamping Division
Transue & Williams Steel Forging Corp.
Alliance, O.

Depend on STEEL's Facts

We are interested in obtaining several reprints of the Market Outlook column of Dec. 31 (page 77).

We find your magazine interesting and are beginning to depend upon it more and more for technical and marketing information for our firm.

John V. Green Jr.
Charles E. Green & Son Inc.
Newark, N. J.

Underground Plant Work

Can you send us several reprints of the article, "Plants Going Underground?" (Dec. 24, page 36), so that we may use or refer to it in the presentation of the industrial defense program of the Business and Defense Services Administration, Department of Commerce?

William E. Haines
Director of Industrial Defense
Business & Defense Services Administration
Department of Commerce
Washington

Facts and Figures to Europe

Please send three copies of this year's "Facts and Figures of the Metalworking Industry" (Jan. 7, page 167). I find this computation most interesting, and several of my friends in Europe are delighted when I send them these reprints (which I have done for several years).

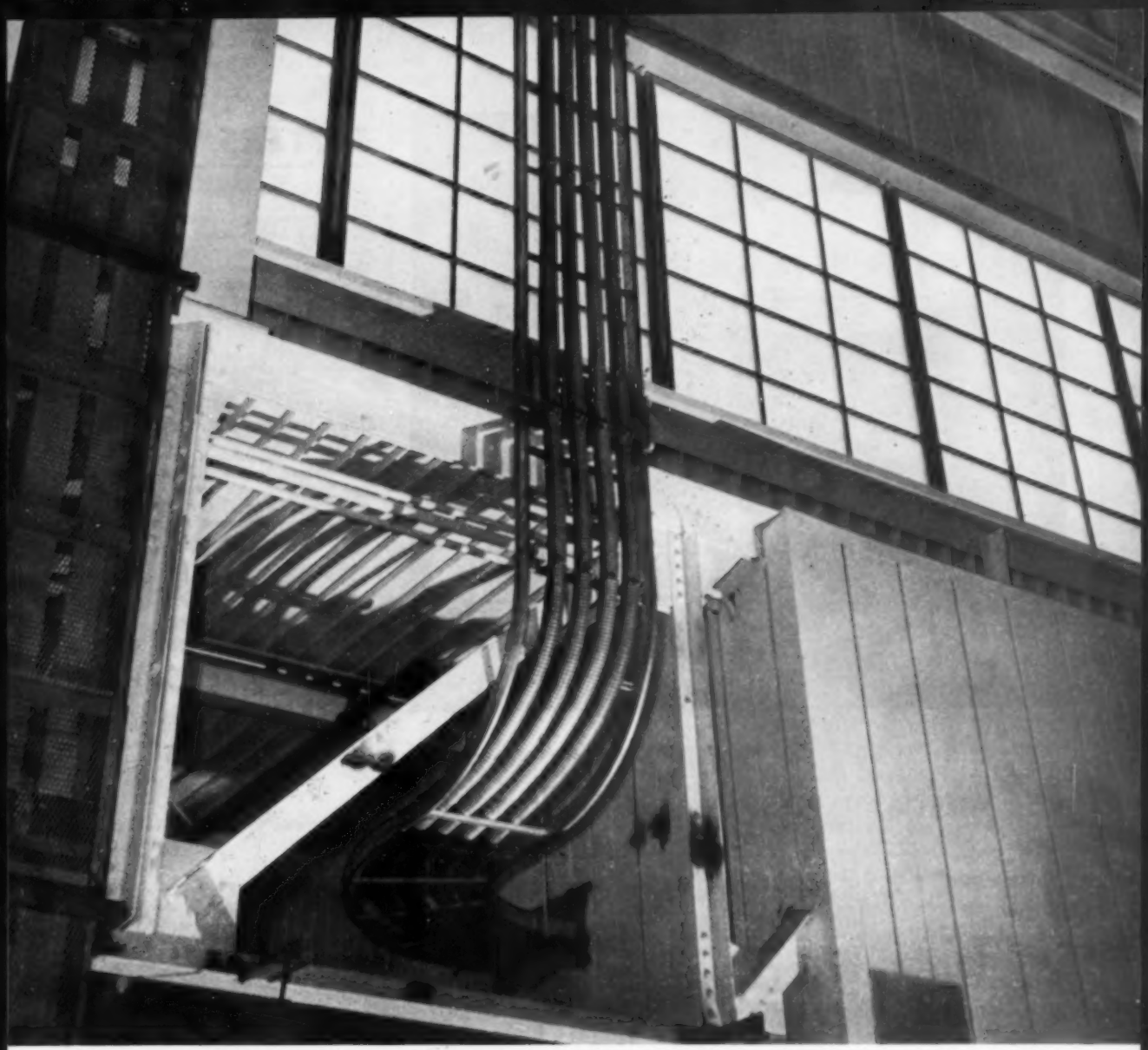
H. Kern
American Saar Steel Corp.
New York

Commends Industrial Leaders

I have just had the pleasure of reading your Program for Management article, "Industry and College: Partners in Development" (Nov. 12, page 119).

I would like to commend you on it. It is publication of farsighted material of this kind which aids in the work of

(Please turn to page 12)



FLEXIBLE Anaconda Interlocked-armor Cable is installed quickly, without rigid conduit. Machines are ready for production days, often weeks sooner.

How to go from vacant space to full production quicker

If you need to expand facilities today, or relocate machines, new types of cables can save you time and money.

The interval between decision to expand and 3-shift production can be an agonizing wait or a pleasant surprise for management. Much depends on plant wiring.

A flexible plant electrical system enables management to expand quickly into new space as it's needed. Or to speed rearrangement of machines when models or styles of products are changed. Here's where modern Anaconda power cables can save you time and money.

ANACONDA Duralox* Interlocked-armor Cable, for example, ends the laborious and expensive process of installing rigid conduit. This cable has its own rugged, flexible metal covering . . . needs nothing more. It is installed quickly—indoors or out—in long, unbroken runs . . . is always accessible, 100% salvageable. Not only does it get you back into production sooner, it costs less installed.

The Man from Anaconda can give you many helpful suggestions on your plant wiring. And he will be glad to work with your engineers in selecting the *right* cables for the job, and to help increase the flexibility and efficiency of your electric system. Offices in 27 major cities—or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. *Reg. U. S. Pat. Off. 86210

NATIONAL ELECTRICAL Week FEB. 10-16, 1957

ASK THE MAN FROM **ANACONDA®**

ABOUT **POWER CABLE**

WHAT'S WRONG?

The spring buyer did not nail down the specifications. Spring suppliers are interpreting the specs differently.

Supplier A, quoting $62.15, noted that several specified tolerances were beyond machine capabilities and could only be obtained by using special, costly methods. Believing that the spring was "over specified," he quoted to "common sense" tolerances, not to the questionable tolerances specified.

Supplier B, quoting $74.30, noted the too-tight tolerances and also recognized that, in packaging, tangling would present a costly assembly problem. Without taking explicit exception, he decided to quote to more realistic tolerances and also decided to include the cost of special packaging.

Supplier C, quoting $139.40, quoted *exactly to specs*, figured on using special methods and specialized inspection to meet specs, and special packaging to avoid tangling. He offered several engineering suggestions for cost reduction which, if accepted, would have made him competitive with Supplier B.

Which is the best bid? This depends on whether or not the tolerances specified were necessary and complete.

When purchasing springs, here are some good rules to follow: (1) specify tolerances realistically; (2) include all pertinent information; (3) insist on conformance to specifications (a supplier's Quality Report is a good way to check this); and encourage your spring supplier to offer suggested changes to the specs in the interests of economy. By doing so, quotations like these and "quality headaches" can be avoided.

Write for information on spring buying.

Every shipment of parts supplied by Hunter automatically *includes a Quality Report on tested characteristics.*

HUNTER

HUNTER SPRING COMPANY

19 Spring Avenue, Lansdale, Pennsylvania

(near Philadelphia)

SPRINGS • STAMPINGS TEST APPARATUS

LETTERS

(Concluded from page 10)

organizations such as the Ohio Foundation of Independent Colleges. When industrial leaders themselves point out the effectiveness of gifts to education, it does much more good than when educators alone do it.

Our thanks for the publication of this article.

Dr. Lloyd L. Ramseyer
Chairman
Ohio Foundation of Independent Colleges Inc.
Columbus, O.

Education for Traffic Club

I am on the educational committee of the Nassau and Suffolk Traffic Club and feel that your article, "Let Traffic Managers Manage" (Nov. 26, page 68), would be of interest to our membership. I would appreciate receiving 100 copies.

T. J. Hill
Traffic Representative
Long Island Lighting Co.
Hicksville, N. Y.

'Thanks for Fine Job'

Please forward two copies of your excellent article, "Aircraft: Feast, Not Famine" (Nov. 26, page 57). Our sincere thanks for your continuing fine job.

Donald C. J. Gray
Factory Manager
Hastings Equity Grain Bin Mfg. Co.
Hastings, Nebr.

Management Series: Helpful

In your Apr. 23 issue, you ran the third article in your 1956 Program for Management, "Ideas for Industry" (page 105). Even though the request is late, I would like one, or if possible, two reprints.

I think your Program for Management articles contain good "red meat" and certainly hope you continue with this helpful series in future years.

Norbert A. Wiesnet
Purchasing Agent, Raw Materials
Machinery & Systems Division
Carrier Corp.
Syracuse, N. Y.

Custom Molding of Parts

We were interested in the story, "Metal Powder Parts Get New Look" (Dec. 3, page 121), which covers advances being made in powder metallurgy. It is No. 6 in your Production Ideas series.

For several years, we have been trying to interest companies with powder metallurgy equipment in making larger and more intricate parts. Do you have information on companies that would be interested in custom molding of these parts?

We suggest a size of approximately 5 in. OD and a weight of approximately 1½-lb.

H. E. Fischer
Valley Forge Products Inc.
Long Island City, N. Y.

• *A list of five large manufacturers of sintered metal parts is being forwarded. For a list of the many smaller producers, contact: Kempton H. Roll, Metal Powder Association, 420 Lexington Ave., New York 17, N. Y.*

Acme-Gridley

fully automatic turret lathe . . . gives you increased production in inverse ratio to cost

This customer chose a model MR Acme-Gridley to produce this packing gland nut, because he was able to increase his production by more than 3 times that of the former method.

The Acme-Gridley automatically controlled cycle is predetermined to give the minimum time per piece, on *every piece*. Because each tool-slide is independently cammed and selective spindle speeds are automatically controlled, machining can be done at the surface speed best suited for required finish and tolerance.

WRITE today for your free copy of new Bulletin MR-56. See why Acme-Gridley Basic Design lets you increase production and lower unit costs.

JOB FACTS

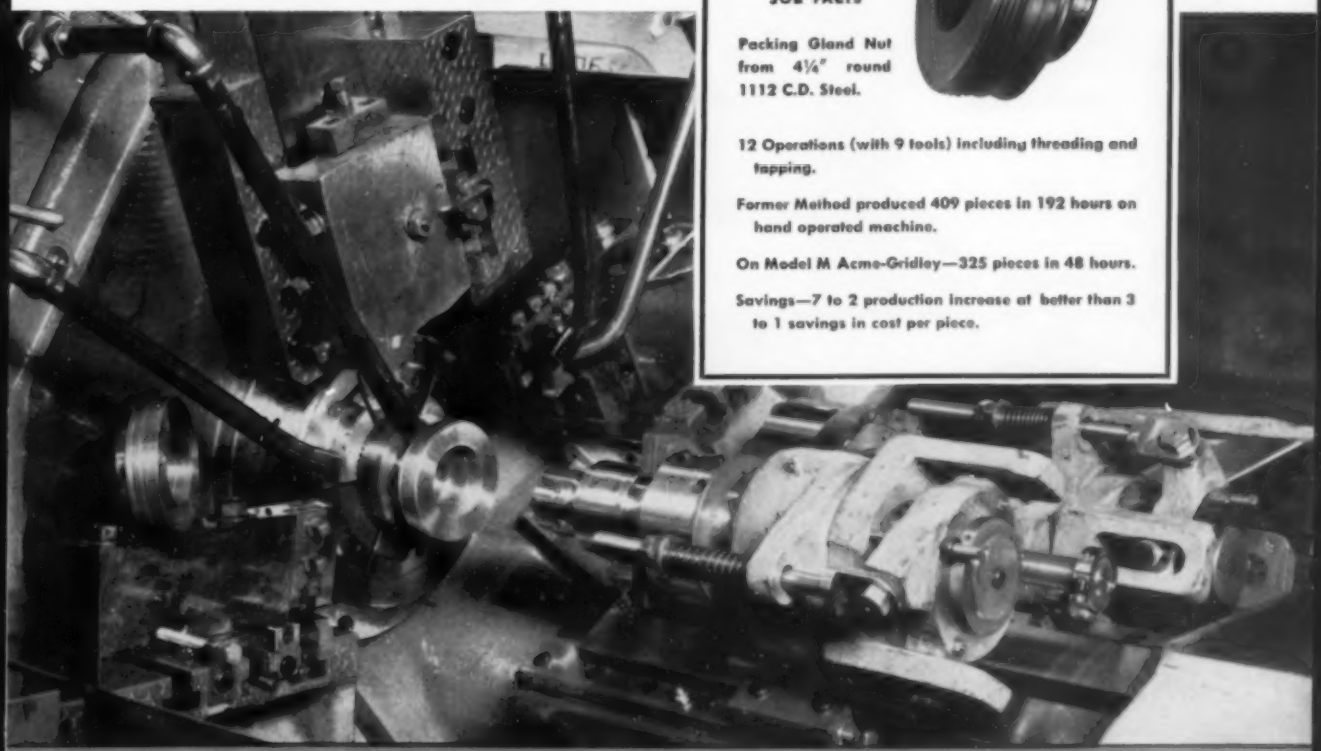
Packing Gland Nut from 4¼" round 1112 C.D. Steel.

12 Operations (with 9 tools) including threading and tapping.

Former Method produced 409 pieces in 192 hours on hand operated machine.

On Model M Acme-Gridley—325 pieces in 48 hours.

Savings—7 to 2 production increase at better than 3 to 1 savings in cost per piece.



National Acme

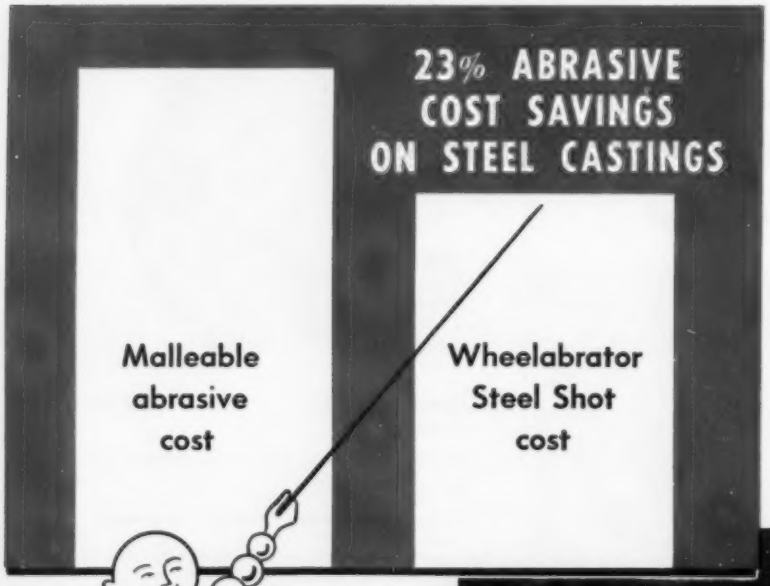
THE NATIONAL ACME COMPANY, 189 EAST 131ST STREET, CLEVELAND 8, OHIO

SALES OFFICES: • Newark 2, New Jersey • Chicago 6, Illinois • Detroit 27, Michigan

WHEELABRATOR® STEEL SHOT

Saves $8,000 a year for Crucible Steel Casting Co.

Wheelabrator Steel Shot has proved most economical in cleaning steel castings at Crucible Steel Castings Co.! Tests made in a 3-wheel Wheelabrator Monorail Cabinet showed these results: In 322 hours, the 3 wheels consumed over 19,000 lbs. of malleable abrasive for an abrasive cost averaging $1.578 per wheel hour for each wheel. In 202 hours, the machine used approximately 6,800 lbs. of Wheelabrator Steel Shot for an average abrasive cost of $1.215 per hour for each wheel. This means savings of $.363 per hour for each wheel. The Milwaukee steel foundry operates 10 wheels a total of 100 hours each day, so daily abrasive savings add up to approximately $36.30 — or about $8,000 annually. You, too, can save with Wheelabrator Steel Shot, the low-cost answer to cleaning problems.



Test Machine

The findings reported above resulted from tests conducted in the Wheelabrator Monorail Cabinet shown below. This is only one of several airless blast cleaning machines operated by Crucible Steel Castings Co. to clean the wide variety of castings produced.

For additional information on Wheelabrator Steel Shot, send today for Bulletin No. 89-C

WHEELABRATOR
CORPORATION
509 S. Byrkit Street — Mishawaka, Indiana

NOTHING *can equal Stainless Steel*

in its unique combination of properties

No other design material can match Stainless Steel in its unique combination of desirable properties: corrosion resistance, strength, hardness, beauty, cleanability and easy fabrication. If you're looking for a reliable source of supply, remember that United States Steel offers you the widest range of types, finishes and sizes.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS
PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

USS

For Formability...

Jet engine and pressure vessel makers are using roll-formed rings in large numbers these days. Alloy Manufacturing Company in Pittsburgh is a major supplier of Stainless Steel fabricated parts, and they process this steel on ordinary "carbon steel rated" equipment without difficulty.

For Cleanliness...

Bates Manufacturing Company, Lewiston, Maine, is a famous name in cotton goods. They used to have trouble with dyeing equipment; the iron vats held the old colors and "killed" new colors. With Stainless Steel dye kettles, old colors actually *rinse* out, without costly scrubbing.

For Style...

G & G Woodcraft, Dinette Division, in Detroit, is selling a handsome new dinette table, designed by Gelitis, with a polished Stainless Steel top. The top is backed with plywood, and there is no metallic sound when it is struck. Stainless is a perfect material for contemporary design, and it's so *practical*.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

ULBRICH Stainless Steels

Immediate Delivery from Stock

STRIP · Flat Wire and other Stainless Steels

a foot or a pound and up to your EXACT requirements from the BIGGEST little Converting Mill in the country.

Complete Inventory

Phone:
Wallingford 9-7771
Wallingford, Conn.
Established 1924

Certified

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH
Editor, WALTER J. CAMPBELL
Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY ..... *Market Editor*
J. D. KNOX ..... *Steel Plant Editor*
ALLEN G. GRAY ..... *Technical Editor*
ROBERT F. HUBER ..... *Machine Tool Editor*
HARRY CHANDLER, *Copy Editor*

FRANK R. BRIGGS ..... *Associate Editor*
VAN CALDWELL ..... *Associate Editor*
ROBERT O. JAYNES ..... *Associate Editor*
JOHN R. BOTZUM ..... *Associate Editor*

AUSTIN E. BRANT ..... *Assistant Editor*
BYRON E. KENNEL ..... *Assistant Editor*
ROSS WHITEHEAD ..... *Assistant Editor*
GLENN W. DIETRICH ..... *Assistant Editor*
MAPY T. BORGERHOFF ..... *Assistant Editor*
MARY ALICE EARLY ..... *Assistant Editor*
EILEEN CORTES, *Assistant Editor*

MARY ANN STUVE ..... *Editorial Assistant*
JANE WEDGE ..... *Editorial Assistant*
BETTY ZAYAC, *Editorial Assistant*

THOMAS H. BRYAN, TOM WELSH, *Art Editors*
IRENE KASNER, *Editorial Service*

Resident Editors

New York 17 ..... 60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
STANLEY B. STEWART
Murray Hill 2-2581

Chicago 11 ..... 520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 ..... 2837 Koppers Bldg.
ROBERT M. LOVE
Atlantic 1-3211

Detroit 35 ..... 15800 W. McNichols Rd.
A. DONALD POSTMA
Broadway 3-8150

Washington 4 ..... 1123 National Press Bldg.
JAMES P. MORRISSEY
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT
European Editor

Editorial Correspondents

Birmingham—Birmingham 3-1121 ..... R. W. KINCEY
Buffalo—Emerson 5385 ..... GEORGE E. TOLES
St. Louis—Jackson 1-9281 ..... HAMILTON THORNTON
Youngstown—Riverside 7-1471 ..... GEORGE R. REISS
Los Angeles—Webster 5-3040 ..... NORMAN LYNN
San Francisco—Yukon 6-5151 ..... EDWIN HAVERTY
Seattle—Melrose 1895 ..... R. C. HILL
Cincinnati—Beechmont 1-9607 ..... DICK HAVLIN
Toronto, Canada—Empire 4-9655 ..... F. S. TOBIN
Birmingham, England ..... J. A. HORTON
Paris, France ..... LEON JAUDOIN-PROM
Brussels, Belgium ..... PAUL DE KEYSER
Dusseldorf, Germany ..... DR. HERBERT GROSS

BUSINESS STAFF

Advertising Director ..... H. G. ROWLAND
Advertising Service Mgr. ..... DORIS MITCHELL
Production Manager ..... A. V. ANDERSON
Promotion Director ..... S. F. MARINO
Marketing Director ..... D. C. KIEFER
Circ. & Research Dir. ..... N. R. LADABOUCHE
Circulation Manager ..... G. R. EBERSOLE
Reprints ..... JUNE SCHILENS
Classified Advertising, EVELYN DIETZ

Advertising Representatives

New York 17 ..... 60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) ..... 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. ..... 12 Farmstead Lane
CALVIN FISHER JR.—Orchard 7-1756

E. Rochester, N. Y. ..... 217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 ..... 2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 ..... Penton Bldg.
J. K. GILLAM, N. W. MANNING
Main 1-8260

Cincinnati 6 ..... 2215 Victory Pkwy.
E. L. FRANKE—Parkway 1-0711

Detroit 35 ..... 15800 W. McNichols Rd.
C. A. TALLINGER JR.—Broadway 3-8150

Chicago 11 ..... 520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER
Whitehall 4-1234

Los Angeles 36 ..... 5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 ..... 57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Georgia ..... 1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

BPA

NBP

Published Every Monday By
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, O.
MAin 1-8260

GEORGE O. HAYS ..... *President*
RUSSELL C. JAENKE ..... *Executive Vice President*
FRANK G. STEINEBACH ..... *Vice President and Secretary*
FRANK O. RICE ..... *Vice President*
JOSEPH P. LIPKA ..... *Treasurer and Assistant Secretary*

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

For improved O-H combustion practice...

Record O_2 Reliably, Heat after Heat

Key to continuous, reliable records of oxygen in open-hearth exhaust gases is the unique L&N sampling system. Self-flushing, self-cleaning, this assembly delivers a thoroughly scrubbed sample of waste gas to the L&N Magnetic Oxygen Analyzer under positive pressure, without mechanical pumps or aspirators . . . and with very little maintenance.

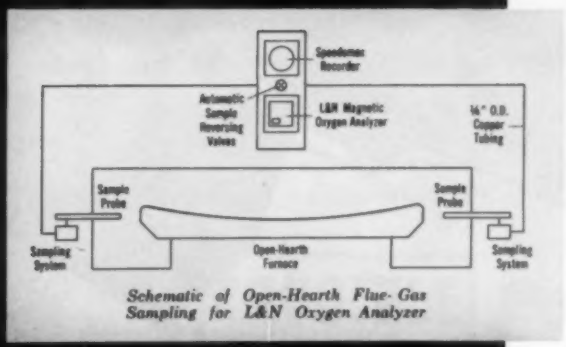
Spray-flushing of the probe opening and internal passages prevents slag buildup and dirt accumulation. The sample gas is drawn from the water-jacketed, stainless steel probe by a steam jet assembly. Expansion of steam accelerates the gas to a high velocity; condensation of the steam scrubs the sample by precipitating all dust and dirt. The cleaned sample travels at 50 ft./sec. in the sampling lines (quarter-inch copper tubing), so that initial response of the *entire* system is only about 10 seconds.

The Magnetic Oxygen Analyzer and the Speedomax G® recorder, calibrated directly in per cent O_2, may be located wherever convenient . . . are quickly checked against air to assure accurate performance.

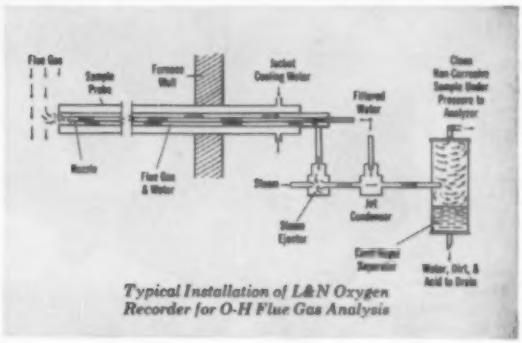
Complete description of this equipment is contained in Process Data Sheet 643(5), available from your nearest L&N representative. Or write us at 4957 Stenton Avenue, Philadelphia 44, Pa.

LEEDS LN **NORTHRUP**
Instruments — Automatic Controls • Furnaces

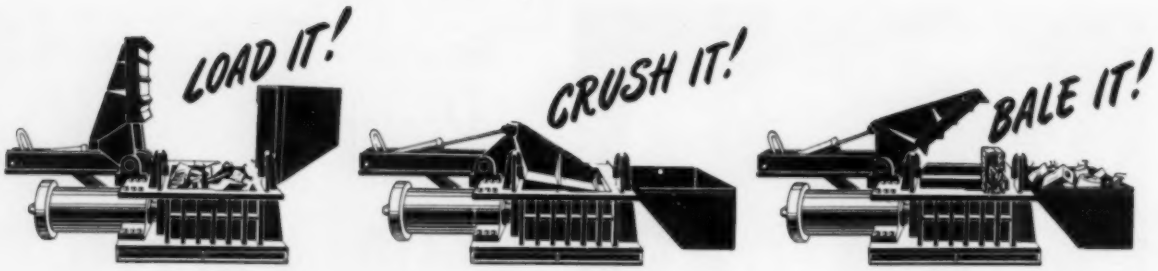
In this O-H shop of Jones & Laughlin Steel Corp., Pittsburgh, the L&N O_2 Analyzer is used with a Speedomax G Controller, which adjusts a fuel-air controller (not shown) to provide automatic combustion control.



Schematic of Open-Hearth Flue-Gas Sampling for L&N Oxygen Analyzer



Typical Installation of L&N Oxygen Recorder for O-H Flue Gas Analysis



We Build the Dempster-Balester to Load It, Crush It, Bale It— Bale After Bale After Bale

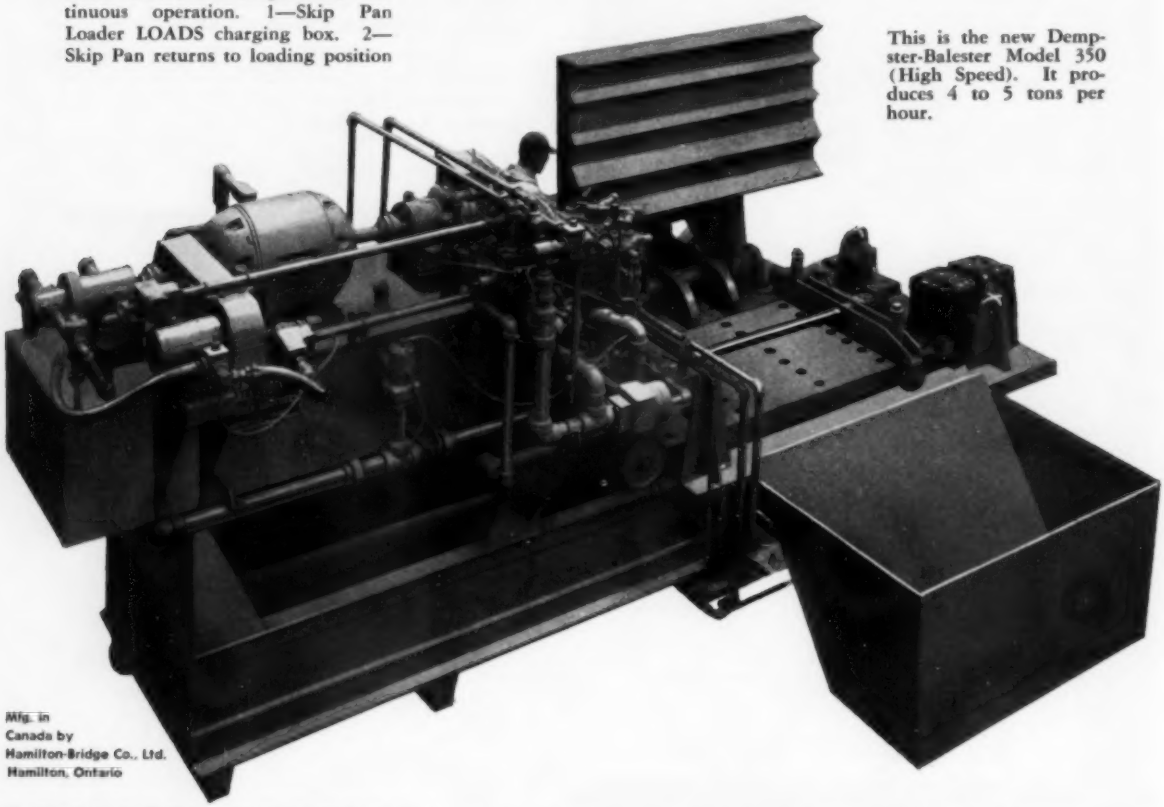
You not only get the nearest thing available to automatic baling when you buy a Dempster-Balester, but you get a press built to take the punishment of scrap metal baling consistently day-in and day-out . . . bale-after-bale-after-bale! The first Dempster-Balester was built in 1940 and it is still in operation. Today, hundreds of Dempster-Balesters are making money for men like yourself in over 200 cities in almost every state of the union, plus 15 foreign countries.

The Dempster-Balester's LOAD IT, CRUSH IT, BALE IT cycle (illustrated above) is a simple 1-2-3 continuous operation. 1—Skip Pan Loader LOADS charging box. 2—Skip Pan returns to loading position and Auxiliary Compression Door CRUSHES scrap with a 45-ton force. 3—As Compression Door returns to up-right position, charging box door closes . . . scrap is BALED and ejected. As each cycle ends another begins.

Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour.

And don't overlook this important point. Before buying a baling press, it's important to know what kind of service you can expect. Certainly, no piece of heavy machinery can operate consistently without maintenance. Breakdowns cost money and when a part is needed for one of our presses, it is usually shipped the day your order is received. An ample stock of repair parts is constantly maintained to take care of you promptly! Write to us today for complete information.

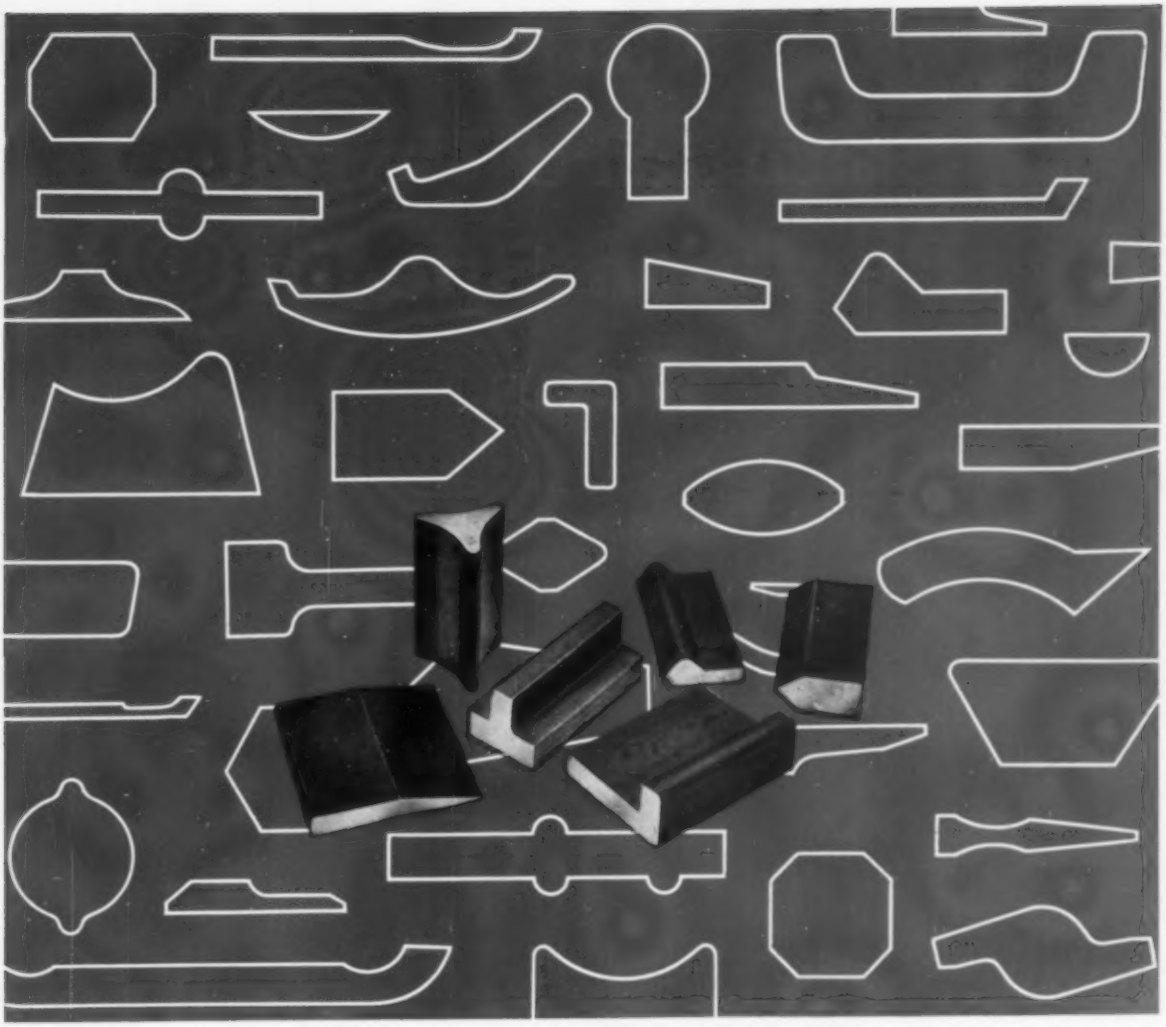
A product of Dempster Brothers, Inc.



This is the new Dempster-Balester Model 350 (High Speed). It produces 4 to 5 tons per hour.

Mfg. in Canada by Hamilton-Bridge Co., Ltd. Hamilton, Ontario

DEMPSTER BROTHERS, 617 Dempster Bldg., Knoxville 17, Tennessee



Crucible special shapes

for better alloy steel parts at lower cost . . .

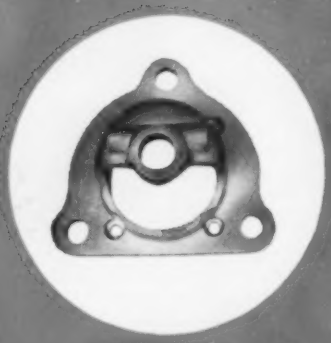
If you're machining intricate sections from solid bars—or using expensive forgings—stop! Choose instead, a *Crucible special shape* that approximates the finished part. *Crucible special shapes* eliminate rough-machining operations . . . reduce scrap losses.

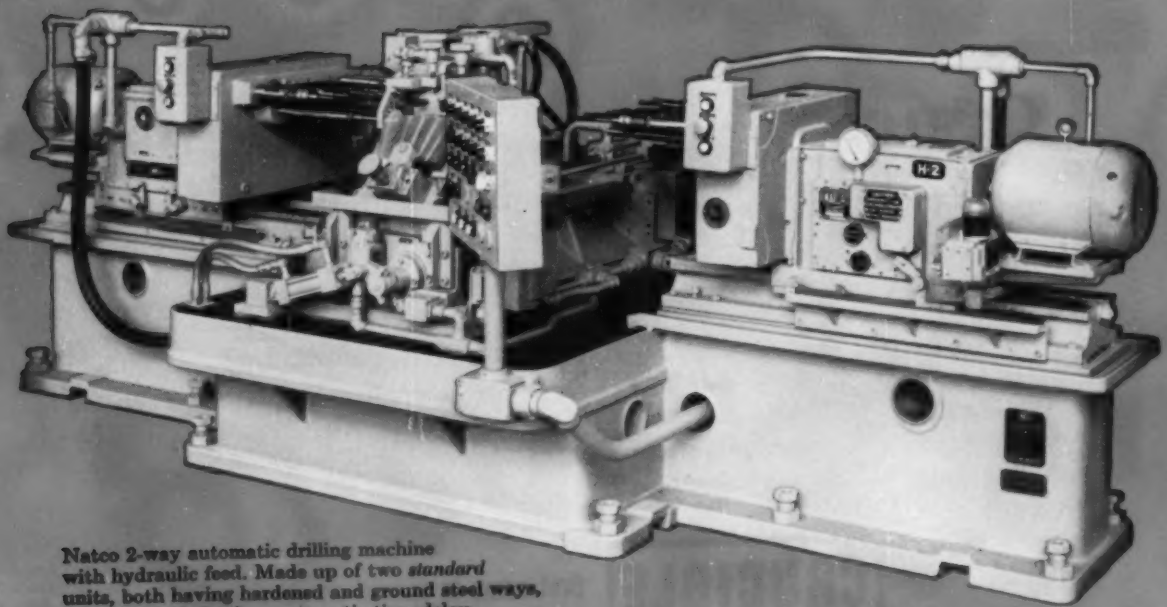
There's practically no limit to the *special shapes* available at Crucible, in a wide variety of alloy steels. Rolls for over 400 special shapes are available—other shapes can be rolled to your specifications. Your local Crucible representative can give you the whole story of how *special shapes* can cut costs—save time. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Natco Standard Units Perform Special Jobs

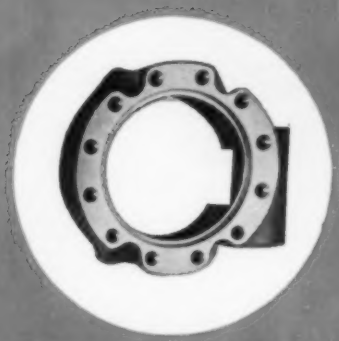


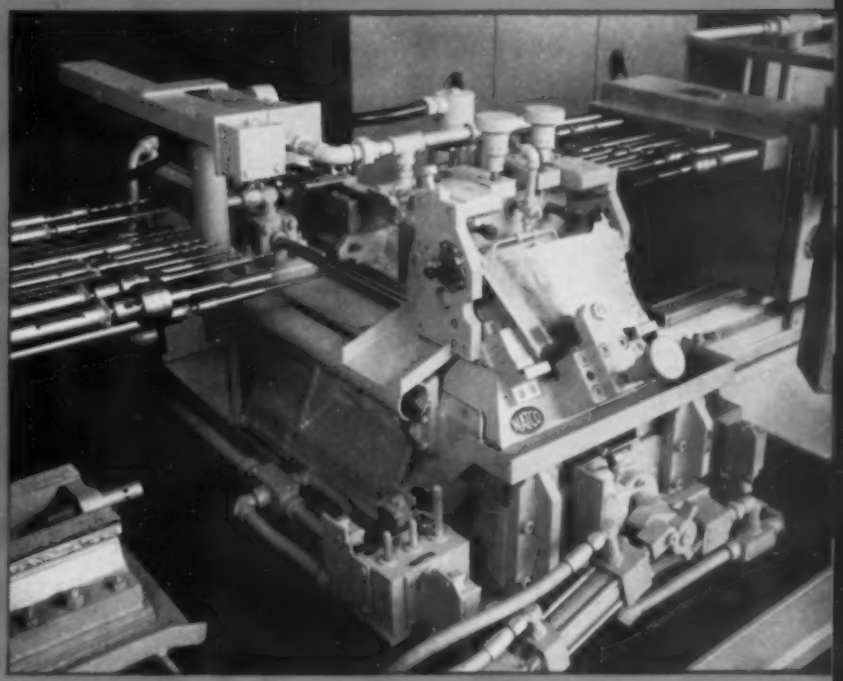


Natco 2-way automatic drilling machine with hydraulic feed. Made up of two *standard* units, both having hardened and ground steel ways, automatic lubrication, automatic time delay and positive stop.

Many *special* jobs can become routine with Natco's *standard* unit design. Take these parts, for instance. Unique parts presenting unique problems. Natco solved them by using *standard* horizontal, self-contained Holeunits with automatic fixtures. Varied operations are performed—production to meet customer's requirements.

Natco's use of *standard* units can mean quicker delivery and lower price to you. Call a Natco Field Engineer to determine whether Natco's *standard* unit design can solve your "special" problems.





Ask for information about the PAYD (Pay-As-You-Depreciate) Finance Plan.

NATIONAL AUTOMATIC TOOL COMPANY, INC.

Richmond, Indiana

NATCO

Multiple-spindle drilling, boring, facing and tapping machines. Special machines for automatic production.

Call Natco offices in Chicago, Detroit, Buffalo, New York, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

Now—Cleveland provides a single source for all your socket screw requirements

Simplifies specification, cuts paper work, speeds delivery

CLEVELAND STANDARD SOCKET SCREW PRODUCTS
UNIFIED THREADS—CLASS 3A FIT

Type	Standard Sizes (diam.)	Material
Socket head cap screws	#0 to 1½ in. (larger sizes avail.)	Alloy steel, heat treated or Nonmagnetic 18-8 stainless
Set screws (cup, half dog, flat, cone or oval points)	#0 to 1 in. (#0-#3, cup point only)	Alloy steel, heat treated or Nonmagnetic 18-8 stainless (to ½ in., cup point only)
Flat head socket cap screws	#4 to ¾ in.	Alloy steel heat treated
Button head socket cap screws	#4 to ⅝ in.	same
Shoulder screws (stripper bolts)	¼ to ¾ in.	same
Dowel pins	⅛ to 1 in. (nominal size and .001 in. oversize for repair)	same
Pressure plugs	⅛ to 1¼ in. NPTF	same
Socket screw keys	.028 to 1 in. across flats; short or long arm	same

Cleveland has expanded its socket screw line to provide a single source for all your socket head needs.

At the same time, and in conjunction with opening its new plant, Cleveland is doubling its factory warehousing capacity. This, plus the latest materials handling equipment, will enable Cleveland distributors to get same-day shipment of your larger orders.

Included in the expanded Cleveland socket screw line are precision dowel pins. While not a socket head product, they are basic fasteners for the important tool and die industry, where they are closely associated with socket head cap screws and shoulder screws. We offer them as part of a complete service.

Cleveland socket head cap screws are upset forged from heat-treated alloy steel. This results in symmetrical, unbroken grain structure in heads, threads and fillets—greater fatigue and tensile strength, stronger fasteners.

Write for latest literature and technical data. Then see your local Cleveland Cap Screw distributor for all your socket screw requirements.

THE CLEVELAND CAP SCREW COMPANY
4444-2 Lee Road, Cleveland 28, Ohio

CALENDAR
OF MEETINGS

Jan. 21-22, Solar Furnace Symposium: Westward Ho hotel, Phoenix, Ariz. Sponsor: Association for Applied Solar Energy, 3424 N. Central Ave., Phoenix, Ariz. Secretary: John I. Yellott.

Jan. 21-25, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute's address: 33 W. 39th St., New York 18, N.Y. Secretary: N. S. Hibshman.

Jan. 23-24, Steel Shipping Containers Institute Inc.: Winter meeting, St. Regis hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N.Y. Secretary: L. B. Miller.

Jan. 24-26, National Tool & Die Manufacturers Association: Winter meeting, Biltmore hotel, Palm Beach, Fla. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Jan. 28-31, American Management Association: West coast general management conference, Hotel Statler, Los Angeles. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Jan. 28-31, Associated Equipment Distributors: Annual meeting and exhibit, Conrad Hilton hotel, Chicago. Association's address: 30 E. Cedar St., Chicago 11, Ill. Executive secretary: P. D. Hermann.

Jan. 28-29, Industrial Heating Equipment Association Inc.: Annual meeting, Shoreham hotel, Washington. Association's address: Associations Bldg., Washington 6, D.C. Executive vice president: Carl L. Ipsen.

Jan. 28-31, Plant Maintenance & Engineering Show & Conference: Public Auditorium, Cleveland. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N.Y.

Jan. 28-Feb. 2, American Road Builders Association: Road show and convention, Congress hotel and International Amphitheatre, Chicago. Association's address: 600 World Center Bldg., Washington 6, D.C. Executive vice president: Louis W. Prentiss.

Feb. 4-6, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 4-8, American Society for Testing Materials: Committee week, Benjamin Franklin hotel, Philadelphia. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Feb. 5-7, Society of the Plastics Industry Inc.: Reinforced plastics division conference, Edgewater Beach hotel, Chicago. Society's address: 250 Park Ave., New York 17, N.Y. Executive vice president: William T. Cruse.

Feb. 7-8, American Management Association: Special conference on nucleonics in industry, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 7-8, Malleable Founders' Society: Technical and operating conference, Wade Park Manor, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Executive vice president: Lowell D. Ryan.

Feb. 11-13, Drop Forging Association: Winter meeting and exhibit, Edgewater Beach hotel, Chicago. Association's address: 419 S. Walnut St., Lansing 33, Mich. Secretary-treasurer: Richard Marcus.

Feb. 13-15, American Management Association: Mid-winter, personnel conference, Palmer House, Chicago. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 24-28, American Institute of Mining, Metallurgical & Petroleum Engineers: Annual meeting, Roosevelt and Jung hotels, New Orleans. Institute's address: 29 W. 39th St., New York 18, N.Y. Secretary: E. O. Kirkendall.

Feb. 25-Mar. 1, International Heating & Air-Conditioning Exposition: International Amphitheatre, Chicago. Information: International Exposition Co., 480 Lexington Ave., New York 17, N.Y. President: E. K. Stevens.

*Whether president, engineer, coremaker, or molder, the men at Hamilton Foundry all have one thing in common . . . they are *quality conscious.*

Specifications are hit "on the nose" however tough the problem. You get true-to-pattern accuracy . . . skin-smooth finish . . . better machinability . . . right metal specifications. You get castings that satisfy all your requirements—completely.

The trademark Ⓗ® is your assurance of casting quality at its finest. Why not join Hamilton Foundry's long list of satisfied customers?

Call on Hamilton Foundry for HAMILTON QUALITY CASTINGS®

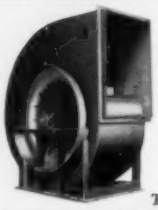
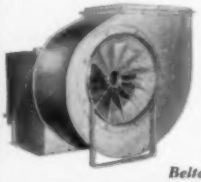
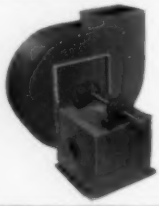
GRAY IRON • ALLOYED IRON • MEEHANITE
NI-RESIST • NI-HARD • NODULITE®

THE HAMILTON FOUNDRY
AND MACHINE CO.
1551 Lincoln Avenue • Hamilton, Ohio
Phone TWinbrook 5-7491

HBT-1

PICK THE RIGHT FAN NOW

—and have no regrets later

"BUFFALO" FAN	APPLICATIONS	CHARACTERISTICS
 *Type BL Fan*	Supplying large ventilation, air conditioning and air cleaning systems. Type BL is used in Class I service, while Type BLH is designed for Class II-IV (high pressure) service. Write for BL Bulletin F-101 and BLH Bulletin F-200.	Extremely quiet and high in efficiency; stable performance from zero pressure to shutoff; non-overloading regardless of system pressure; available in capacities up to 500,000 cfm, all drive arrangements and discharge angles.
Type CR Fan	New "Buffalo" Radial Blade Fan for severe industrial services such as handling abrasive dust-laden air and economical mechanical draft. The CR's high capacity, high pressure characteristics often mean a smaller fan for the job. Write for Bulletin FD-205.	Mechanical efficiency above 78% over a broad range — high volume, high pressure characteristics, also high resistance to abrasion. Long life under severe conditions. An economical fan to own and operate.
Package Propeller Fans	For wall or window-mounted ventilation and exhaust; capacities from 500 to 250,000 cfm. Available in non-sparking, high temperature and corrosion-resistant models, also package roof ventilators. Write for Bulletins FM 1234 and FM 2345.	Husky, die-stamped blades and frame. Proven unusually high in efficiency in hundreds of installations. Compact, easy to install packages for economical ventilation of a single room or a whole building.
 *Belted Vent Sets*	For zone ventilation where quiet and flexibility are required. Capacities from 1000 to 20,000 cfm. Write for Bulletin 3720.	Efficient, quiet, non-overloading. Simple package installation, indoors or out. Capacity adjustable by changing sheaves.
 *Industrial Exhausters*	Moving materials or exhausting fumes, mists, dust; available with heat slinger for temperatures up to 1000° F. Write for Bulletin 3576.	Heavy all-welded steel plate for strength, smooth interior surfaces for minimum friction. Interchangeable Air Wheels or Material Wheels.

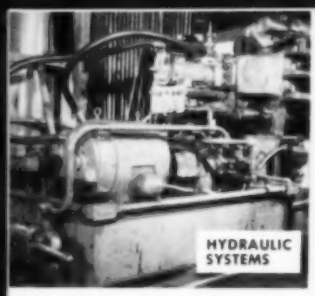
BUFFALO FORGE COMPANY

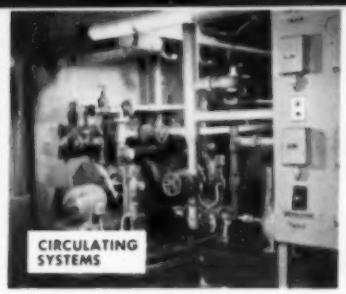
BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

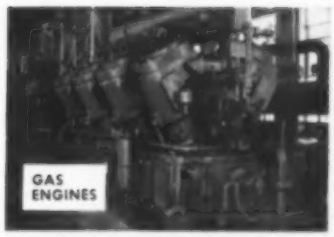


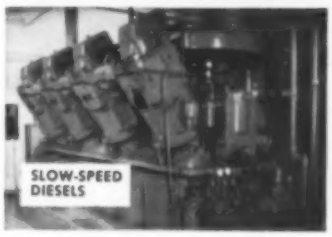


SUN SOLNUS OILS IDEAL LUBRICANTS FOR 80% OF ALL APPLICATIONS

Moderately priced...low in carbon-forming tendencies, Sun Solnus® oils simplify your storage problems by doing with *one oil* many jobs that would otherwise require *several.* Their ability to protect metal parts against corrosion, their resistance to oxidation, and their moderate price all add up to "more lubrication per dollar."

For technical information, see your Sun representative, or write to SUN OIL COMPANY, Philadelphia 3, Pa., Dept. I-51.





SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

PHILADELPHIA 3, PA.

© SUN OIL CO.

In Canada: SUN OIL COMPANY LIMITED, Toronto and Montreal

Valve on left is from compressor run for 3,000 hours with well-known, high-grade oil. At right is same valve after a 3,000-hour run with Sun Solnus oil. Note difference in carbon deposits.

3000-HOUR TEST PROVES SUN SOLNUS OILS REDUCE CARBON BUILD-UP IN COMPRESSORS

Equipment: A three-stage Norwalk horizontal-type compressor. Operating pressure: from 1,000 to 1,500 psi.

Test: The compressor was cleaned thoroughly and filled with a well-known, high-grade oil. The equipment was run for 3,000 hours, then torn down for inspection and cleaning. Then Solnus® 300 was tested in the same way.

Results: Look at the two pictures. You can see for yourself how Solnus oil reduced dangerous carbon build-up.

All types of reciprocating air compressors that have been changed over to a Sun Solnus oil show similar results. A test in your compressor will show the same remarkable reduction of carbon deposits.

You can get a technical bulletin about Sun Solnus oils by asking your Sun representative, or write to SUN OIL COMPANY, Philadelphia 3, Pa., Dept. I-52.

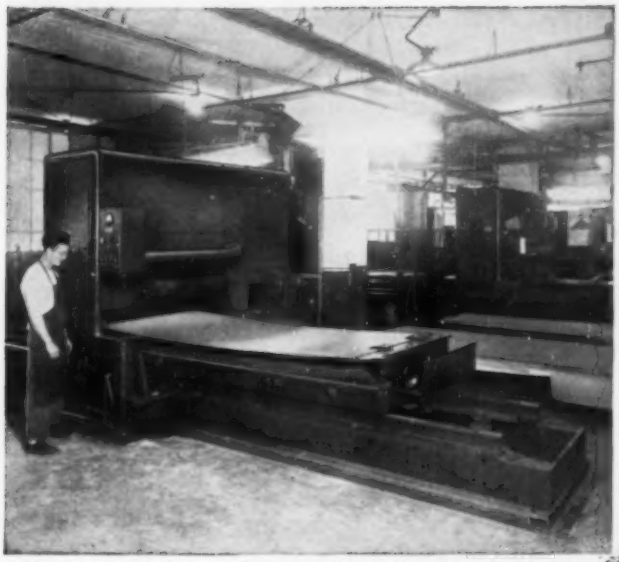
SUNOCO®

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY PHILADELPHIA 3, PA.

© SUN OIL CO.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL



HILL Sheet Grinder and Polisher with reciprocating hydraulic table processing individual sheets.

HILL

GRINDING and POLISHING MACHINES

How much is it costing you to produce ACCEPTABLE finishes on FLAT surfaces

HILL Pinch Roll Grinder and Polisher for "Wet" or "Dry" operations. (Shown in series for straight line production)

HILL 2-Roll Vertical Abrasive Belt Grinding and Polishing machines are the logical result of 25 years of research and experience in producing self contained units for successfully processing ferrous and non-ferrous sheets. We have consistently proven that wide abrasive belt grinding and polishing equipment must incorporate these fundamental features — rugged construction, simplicity of design, accessibility, versatility and centralized controls.

HILL abrasive belt polishing machines are recommended for continuous operation and insure lower production costs with superior finishes as required today by the manufacturers of decorative plastics, food processing equipment, automobile bumpers, lithographers and photo engravers plates, home appliances, etc., etc.

Both types of machines are normally built up to 60″ wide, and larger capacity equipment can also be furnished.

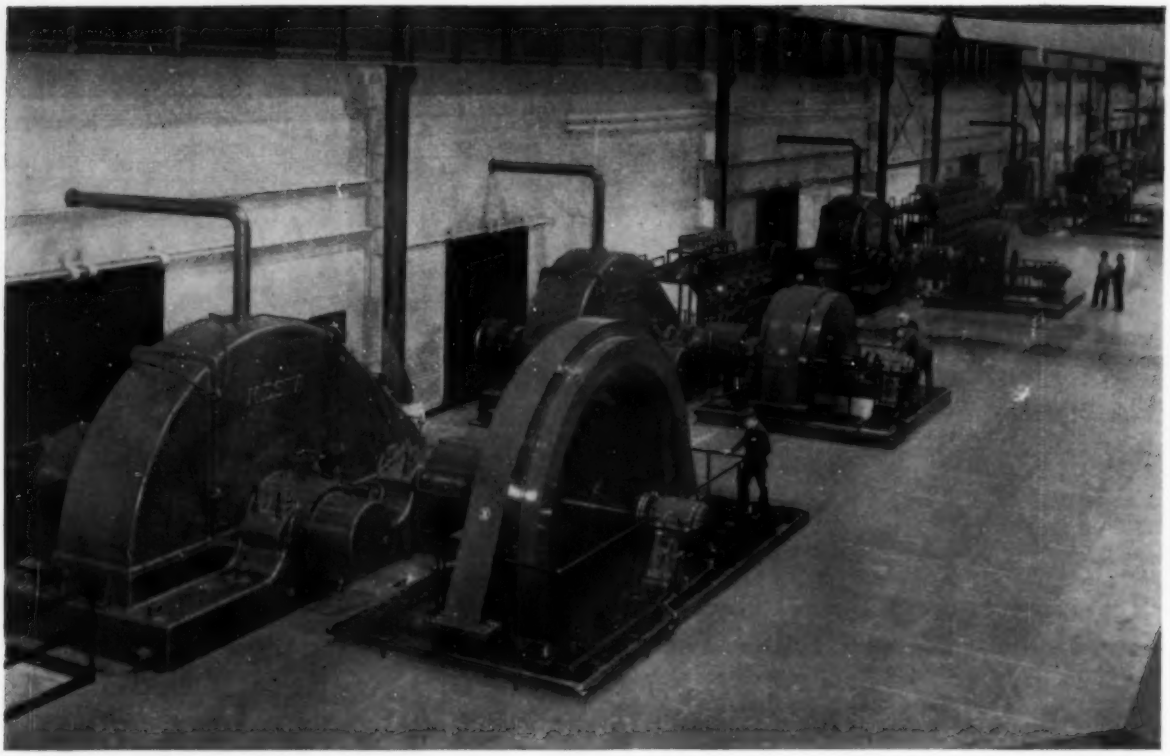
Your inquiries are solicited for detailed information and recommendations.

HILL ACME TOOLS FOR INDUSTRY

THE HILL ACME COMPANY

1209 WEST 65th STREET • • • CLEVELAND 2, OHIO

"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • "CLEVELAND" KNIVES • SHEAR BLADES



USE THE LUBE with POLAR ADDITIVES

● *Enclosed reduction gears and bearings call for a lubricant that has affinity for metal. That's* ***Texaco Meropa Lubricant*** *— fortified with polar additives that cause it to cling to gear teeth and bearing surfaces under the most adverse conditions.*

THE RESULT, of course, is smoother operation, longer lasting protection, extended life, and lower maintenance costs.

Texaco Meropa Lubricant is also notable for its long-lasting extreme pressure properties, which cushion shock and stand up under heavy duty steady loads far in excess of manufacturers' requirements. In addition, *Texaco Meropa Lubricant* resists thickening, does not foam, does not separate and protects metal from corrosion.

For roll stand circulating systems, use *Texaco Regal Oil*. It resists oxidation and sludging, keeps systems clean, roll neck bearings protected.

Let a Texaco Lubrication Engineer help you get top efficiency performance from all your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO **TEXACO Meropa Lubricants**

FOR STEEL MILL GEAR DRIVES

TUNE IN . . . METROPOLITAN OPERA RADIO BROADCASTS EVERY SATURDAY AFTERNOON

Metalworking Outlook

Bethlehem Getting Ready?

Bethlehem Steel Co. reportedly has acquired 3500 acres of land near the mouth of Burns Waterway, 8 miles east of Gary, Ind., on Lake Michigan. Most likely use: For construction of facilities to supplement Youngstown Sheet & Tube Co.'s East Chicago plant—if and when the merger goes through. A sheet and tin mill is thought to be a "must" for Bethlehem, if it is to enter the Chicago market via the proposed merger with Sheet & Tube.

Plans for Atlantic Steel

Atlantic Steel Co., Atlanta, plans to enter the steel bar joist fabricating field this quarter. The company also is considering the production of welded wire mesh for construction use, particularly the reinforcement of cylindrical concrete pipe. In addition, the company is studying the feasibility of using continuous casting. It's short of blooming mill capacity, and the casting process might relieve that problem.

Notes on the Campaign

Watch for David McDonald to win a hands-down victory in his contest Feb. 12 with Donald C. Rarick for the presidency of the United Steelworkers of America. Mr. McDonald has the support of more than 1000 locals; his opponent can claim only 91. Nevertheless, the campaigning is vehement on both sides. The latest charges and countercharges: Mr. Rarick claims he was offered $250,000 to withdraw; Mr. McDonald calls that statement "a plain, unmitigated lie."

UAW Woos Skilled Workers

United Auto Workers is taking another step to try to keep skilled workers happy in an industrial union. It has just scrapped the old system of geographical representation on its National General Motors Corp. Negotiating Committee and replaced it with a "functional" setup which guarantees skilled workers 2 of 11 places on the negotiating committee. Earlier, it had promised that skilled workers could negotiate supplements to general bargaining agreements that would cover their special issues.

Progress Report on Roads

Thus far, $260 million worth of contracts have been awarded to build 491 miles of roads under the highway program. States have submitted proposals involving $4 billion. Highway spending will reach $5.8 billion this year, compared with $5.1 billion in 1956. The figure may top $8 billion annually by 1960. Outlays under the 13-year, federal-state program will exceed $50 billion by 1972, of which $33.8 billion will be the federal share.

Sales Up, Profits Not So Much

Most industries in the metal trades field expect an increase of 2 to 5 per cent in both output and sales during the coming year. J. L. Robinson,

Technical Outlook—p. 67 Market Outlook—p. 103

president of National Metal Trades Association, says expenditures for capital improvements also will show a continuing increase, with steel and transportation equipment firms likely to provide the biggest expenditures. But the increase in sales will not be matched by a commensurate rise in profits, Mr. Robinson believes.

Michigan Gains in Equipment

Michigan is now the nation's largest producer of special dies, tools and metalworking machinery attachments, says Denham & Co., Detroit industrial merchandising agency. The state is the second largest producer of machine tools in the nation. Almost half the value of all special dies and tools produced in the U.S. originates in Michigan. The state accounts for about one-third of the total payroll and value of metalworking machinery attachments produced. Closest in that category is Ohio which is the leading producer of machine tools. Total value of metalworking equipment produced annually in Michigan exceeds $750 million.

German-American Partnerships

Look for more German-American industrial tie-ins, particularly in steel. Samples: Phoenix-Rheinrohr A.G., West German steel and pipe producer, has just formed Phoenix-Rheinrohr Corp., a New York subsidiary to expand its markets in the Americas and to get capital raw materials and steelmaking know-how from the U.S. August Thyssen-Huette A.G. has a technical exchange agreement with Armco Steel Corp. Republic Steel Corp. has just signed a similar agreement with Kloeckner-Werke A.G.

Foreign Aircraft Competition Tight

American aircraft makers continue to face stiff competition from abroad. Trans-Canada Air Lines has just ordered 20 Vanguard turboprop planes from Britain's Vickers-Armstrong Ltd. The order was placed after a comparative study of the Vanguard against American turboprops. TCA's conclusion: Vanguards will give it an $8-million advantage in operating costs and passenger revenues. Even Russia shows signs of invading the commercial field with low-priced models.

Straws in the Wind

Look for the Suez canal to be open to oil tankers by May 1 . . . West Germany's parliament is considering a bill that would take government out of private business; biggest company Bonn owns is the Volkswagen enterprise . . . Great Britain produced 23.1 million net tons of steel last year, a record and 4.4 per cent above the 1955 output . . . U.S. shipyards at the end of December had 84 vessels on order as a result of contracts for 28 new ships placed during the month . . . General Motors Corp. will double its Chevrolet assembly plant at Kansas City, Mo., at a cost of about $25 million.

Costly new equipment is not always the sole answer to production cost problems. Often the wrong raw material may completely nullify expected savings from heavy capital investments in modern machinery.

Consider the case of one manufacturer who installed expensive new forming equipment but was unable to up production to the expected level. Material being formed was cold rolled strip 4" x .060", AISI 1050 steel processed to standard gauge tolerances (.0567" to .0632").

When **CMP** Precision Cold Rolled Strip Steel ordered to a 60% gauge restriction (.0587" to .0613") was furnished, production immediately moved up to the rated capacity of the machines and has remained there.

In addition to increased production, because of the minimization of down time, an incidental and important benefit was the increase in yield per **CMP** ton processed because rejections and out of tolerance parts were eliminated.

Careful consideration of **CMP** Restricted Specification Cold Rolled Strip Steel alternatives on the same careful basis given to your equipment investment, may point the way to similar, or larger pay-offs.

Why not check the possibilities today?

CMP
WHERE YOU CAN GET SPECIFIC SPECS. FOR SPECIFIC JOBS

LOW CARBON
HIGH CARBON
Annealed or Tempered
STAINLESS
ALLOY
ELECTRO ZINC COATED

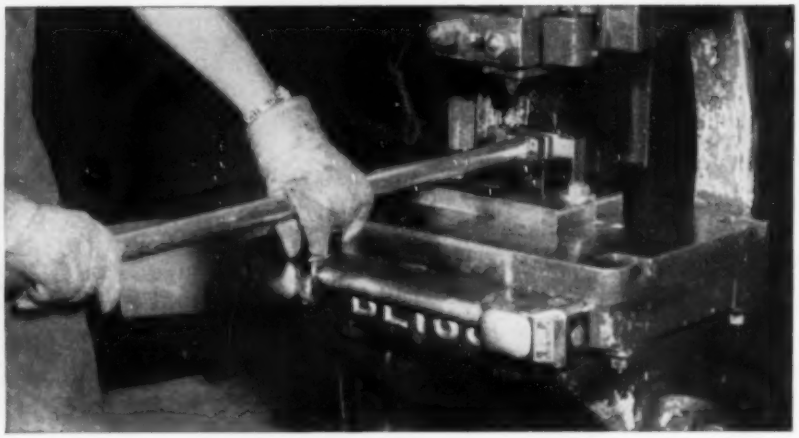
C·M·P

THE COLD METAL PRODUCTS CO.
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
SALES OFFICES: NEW YORK CLEVELAND DETROIT INDIANAPOLIS CHICAGO LOS ANGELES SAN FRANCISCO

Make More Durable Tubular Products at Less Cost

with Special Coated Armco Steel Tubing

TV mast joints are fabricated at the Armco Tubing mill. Note that expanding and dimpling didn't break the tight zinc coating on ZINCGRIP steel tubing in the sample joint.



Tailpipes formed from Armco ALUMINIZED STEEL Type 1 Tubing resist heat and corrosive gases much longer than their carbon steel counterparts.

All special Armco Coated Tubing grades are delivered to you with unbroken protection against rust. Their tightly-adhering zinc or aluminum coatings stay intact through fabricating operations. This way you save the time and expense of painting, dipping, or other protective treatments after fabrication.

ARMCO ZINCGRIP TUBING is a sturdy foe of corrosion. Even in products and parts requiring severe fabrication, its zinc coating remains unbroken—doesn't flake or peel.

ARMCO ALUMINIZED STEEL TYPE 1 TUBING serves longer in the hot jobs because it is formed from a special aluminum-coated steel. No other tubing in its price class matches its ability to withstand combinations of heat and corrosion.

ARMCO ALUMINIZED STEEL TYPE 2 TUBING is also made from a special aluminum-coated steel. It gives tubular products and parts high resistance to corrosion outdoors.

MECHANICAL OR PRESSURE

These three special grades, as well as hot- and cold-rolled steel tubing, are available from Armco for either mechanical or pressure applications. What's more, *Armco can supply tubing sections fabricated to your designs.* This may help you cut costs, step up production.

Fill in and mail the coupon for complete information.

Armco Steel Corporation
887 Curtis Street, Middletown, Ohio

Send me more information on these Armco Coated Tubing grades:

- ☐ Armco ZINCGRIP Tubing
- ☐ Armco ALUMINIZED STEEL Type 1 Tubing
- ☐ Armco ALUMINIZED STEEL Type 2 Tubing

We make_____

Name_____

Firm_____

Street_____

City_____ Zone_____ State_____

ARMCO STEEL CORPORATION
887 Curtis Street, Middletown, Ohio

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Let Railroads Compete

In our rapidly changing and expanding economy, the railroads stand out as a notable exception to our system of competitive freedom.

They are still restricted by archaic regulations laid down by the Interstate Commerce Commission and the various state regulatory bodies.

These regulations date back nearly half a century to the time when railroads virtually monopolized the transportation of goods and people between cities.

Railroads no longer have a monopoly. They account for only 49.4 per cent of intercity freight traffic—compared with 17.7 per cent for trucks, 16.9 per cent for inland waterways (including the Great Lakes), 15.9 per cent for pipelines and 0.04 per cent for air lines.

Here's just one example of what can happen: The Cleveland Electric Illuminating Co. is placing in operation a 108-mile coal pipeline to move 3400 tons of coal a day from Georgetown, O., to its new Eastlake power plant near Cleveland.

The freight rate from Georgetown to Eastlake is $3.22 a ton. The pipeline will save CEI at least $1 a ton. The railroads, recognizing the need for an adjustment, cut rates 44 cents a ton. But the ICC, backed by a federal court, rescinded the action. So the railroads must stick to the $3.22 rate and lose business to the pipeline and the truckers.

That this situation is intolerable from the standpoint of the railroads was recognized by the President's Committee on Transport Policy & Organization. It submitted a report in April, 1955, recommending constructive changes which the President termed "a brilliant piece of work." The Hoover report also suggested consolidating and streamlining the ICC and other regulatory agencies into one unit within the Department of Commerce.

The roads should be permitted to compete on an equal footing with other types of transportation, subject, of course, to equitable but not discriminatory regulation.

The benefit would be in the stimulation of a modernization program that would mean more business for metalworking and the efficient transportation system the nation needs in peace and war.

Irwin H. Such
EDITOR-IN-CHIEF

WHAT'S AHEAD...

in steel service and supply

NEW STEELS—Dozens of new sizes and new types of steel have been added to Ryerson stocks in recent weeks—or will be added in the immediate future. Among these products are:

- New Type 202 Allegheny stainless sheets in more gauges
- 8620 alloy plates
- Cold finished leaded Rytense bars (medium-carbon manganese steel)
- Rycut bars (leaded alloy) in greatly increased size ranges
- A west coast stock of fluid power tubing (including hydraulic fluid line tubes to JIC *and* AMS-5050 specs.) previously carried only at our eastern and midwest plants
- Leaded C1141 in cold finished rounds

These are just a few of the additions that make the world's largest steel stocks even larger and make steel buying quicker and more convenient.

NEW QUALITY SAFEGUARDS—A quality control system even more comprehensive than before includes among many new safeguards:

- A more scientific color code that makes steel identification more error proof
- Tolerance control of tubing for cylinder applications that allows you to order more accurately to O.D. and *I.D.* instead of to the customary O.D. and wall

In all, scores of controls will assure the dependable quality of Ryerson steels in 1957.

STEEL SUPPLY OUTLOOK—Demand for most thicknesses of carbon steel plates, heavy structurals and flat rolled 18-8 stainless will undoubtedly continue to exceed supply—but *all* other steels are in good supply at Ryerson and should remain in good supply during the entire year.

STEPPED-UP SERVICE—In 1957 better than five out of every six orders for steel from Ryerson stock will be shipped within 24 hours—and when emergency demands we can send steel on its way to a customer in an hour or two. Service in the Indianapolis and Charlotte areas will be further improved with the completion of new Ryerson plants in these cities during 1957. And we are enlarging and modernizing—adding new equipment—from coast to coast so that we may always be able to supply the steel you need, exactly when you need it.

So here's our steel-service pledge to you for 1957—an even wider selection of steels, even more safeguards to assure dependable high quality, and service that always meets your requirements—now and throughout the year.

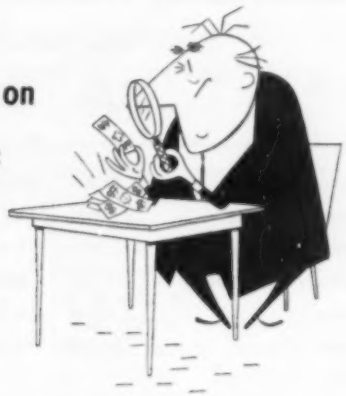
RYERSON CERTIFIED QUALITY

RYERSON STEEL

In stock: Carbon, alloy and stainless steel . . . bars, structurals, plates, sheets, tubing, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Tight Credit: Effects on Day-to-Day Business:



1. Credit managers are upgrading their requirements.
2. Management is taking a closer look at daily financial sheets.
3. More effort is being put on collections as they slow down.
4. Some companies are passing up cash discounts on bills.
5. Bills are being put off until the latest possible minute before payment.
6. Management is watching inventories closer.
7. Some companies are resorting to "factoring" of inventories and receivables.

Closer Look at Cash Policy

FRB's policy of restraint thus far has had no serious direct effect on most companies' daily operations. It forces them to economize and review financial practices

TIGHT CREDIT is having little, if any, direct effect on the *volume* of business of most manufacturers, but it is having a decided effect on *how* they do business. Management is taking a much closer look at anything that might tie up too much cash for too long a time.

As one midwest credit man sums it up: "Manufacturers are almost completely untouched in their daily operations by any tight credit or money problems. They are well insulated by their channels of distribution against the prime source of such problems—the consumer. It will be some time before the effects filter down to the producer."

Matter of Rating—This doesn't mean that just anybody can get all the money he needs when he needs it. A company which has a shaky credit rating will have difficulty now. New firms which have not had the chance to establish A-1 ratings may have trouble. But if an established company, regardless of its size, has kept its house in order, it can get all the money it needs for almost any day-to-day purpose. (Long-term financing is another matter.)

It will cost more to borrow now than it did a year ago, but as one company treasurer puts it: "Money is a raw material just as labor and steel are. Its cost has gone up as wages and prices have. Higher interest may be a real consideration for long term financing, but for everyday operations, it's a small matter."

Problem No. 1 — It is mainly through collections that most manufacturers get a hint of any tightness in money. While most companies say that receivables are in good shape, there are spotty reports that collections are running behind year-ago levels, or that customers are putting off payment until the last possible minute. The Chicago Association of Credit Men reports that the number of bills turned over to collection agencies has increased 20 per cent in the last year. While the large share of this gain is accounted for by retail stores, small metal fabricators and appliance distributors are prominent on the lists. Credit managers say it takes more effort now than it did a year ago to keep collections current.

Companies offering a discount for early payment of bills report there is little change in the number of customers who take it. Those few who have dropped it claim it is cheaper to pass up 0.5 per cent and have the money for short-term needs than to pay up and then have to borrow from the bank at 3.5 per cent or more.

Second Look — Says the credit manager of a fabricated structural steel firm: "In 1954, if an account got 120 days behind, he was still considered a good customer because we all knew that everybody was having trouble collecting bills. Today, if the same customer goes over 90 days, we give him special attention."

Company daily financial sheets probably are getting more atten-

tion today than for many years past. The treasurer of a fastener company says: "The first order every morning is to check our daily financial sheet. We're watching carefully to avoid dipping into our folio or going to the banks. However, if we need to borrow, our bankers tell us it will take no longer than a phone call and a trip downtown to get what we need."

Eye on Cupboard — Inventories are coming under closer scrutiny to avoid tying up cash which could be used better elsewhere. One auto supplier told STEEL that a Detroit plant had ordered for February delivery but delayed the order when it found that auto assemblies were not keeping on schedule. "We're ready to deliver in February, but the stuff is going to sit on our floor for another month. We're simply holding his inventory for him, and we're getting charged with it."

In cases where companies have been unable to obtain funds through usual channels, they have been forced to put up their receivables or inventories as security. Called "factoring," this credit device has never before made much headway in hard goods. Most firms resorting to it are small. The consensus is that only small companies are having any serious problems with tight credit.

No Letup — The chances are good that tight credit will have a more direct effect on manufacturers before too long. In spite of congressional and business pressures, the Federal Reserve Board is holding to its policy of restraint to check inflationary forces.

More and more companies with sound business practices are beginning to side with the Fed. They point to five benefits from tight credit: 1. It is helping to hold down prices and slow down inflation. 2. By preventing some marginal borrowers from starting expansion projects, it makes more materials available for others who have sufficient capital to go ahead. 3. It keeps inventories from soaring. 4. It is putting a check on housing, which some observers believe is overexpanded now. 5. By forcing manufacturers to economize and improve financial practices, it is helping to keep over-all costs down.

MORE MONEY FOR DEFENSE HARD GOODS

(Fiscal Year in Millions)

Category	1955 actual	1956 actual	1957 estimate	1958 estimate	Recommended new obligational authority for 1958
Aircraft	$8,037	$7,146	$6,786	$6,737	$6,232
Ships	1,009	917	928	1,040	1,555
Guided missiles	631	1,168	1,506	2,039	2,646
Military public works	1,582	2,008	1,973	2,242	2,122
Other	3,319	2,973	2,511	2,457	1,597
Totals	14,578	14,212	13,704	14,515	14,152

Budget Rules Out Tax Cuts

THE PRESIDENT sent Congress the government's second biggest budget since World War II: $71.8 billion for fiscal 1958.

Receipts for the year are estimated at $73.6 billion, leaving a surplus of $1.8 billion for retirement of the national debt.

Defense — Biggest item in the budget: National security expenditures of $43.3 billion. About 59 cents of every budget dollar will go for national security items like military spending, the military part of the mutual security program, atomic energy and stockpiling of strategic supplies.

Other major budget items: Interest, $7.4 billion; veterans, $5 billion; agriculture, $5 billion; labor and welfare, $3.5 billion; international, $2.4 billion; commerce and housing, $1.8 billion; natural resources, $1.5 billion; general government, $1.5 billion; allowance for contingencies, $400 million.

Who Pays — Receipts will come from individual income taxes (51 per cent), corporation income taxes (29 per cent), excise taxes (12 per cent) and customs and other sources (8 per cent).

The three fiscal years, 1956-58, have seen government spending turn higher after decreasing in 1954 and 1955. The budget for 1958 is $2.9 billion higher than 1957's; 1957's is $2.4 billion more than 1956's. That year also saw the deficit turn into a surplus of $1.6 billion. Latest estimate for the surplus in 1957 is $1.7 billion.

Steel Expands in West

Colorado Fuel & Iron Corp., Denver, says enlarged production facilities at its Pueblo, Colo., plant will increase employment by 1500.

A 240-ton open hearth furnace is nearing completion and capacity of nine of the mill's 16 older furnaces has been increased by converting them to double ladle heat operation.

Republic Boosts Berger Plant

Capacity for making steel kitchen cabinets will be enlarged one-third by Republic Steel Corp.'s expansion of its Berger Division plant in Canton, O. The new facilities will be in operation before July 1.

Since 1952 over $2 million has been spent in boosting production of Republic steel kitchens.

Scrap Men See Big Demand

Institute of Scrap Iron & Steel predicts large needs in '57 from both domestic and foreign users of purchased scrap. The industry provided a record 41 million tons in '56

THE SCRAP INDUSTRY, with a record year tucked under its belt in 1956, is looking forward to continued high volume this year. Members expect steel mill operations will continue at or near capacity well through the second quarter, assuring a vigorous domestic demand for scrap iron and steel.

Record — During the past 12 months, the industry provided 36 million tons of purchased scrap for domestic consumption and about 5 million tons for export. The total of 41 million tons of purchased scrap is more than 5 per cent above the best previous year.

E. C. Barringer, executive vice president, in opening the Institute of Scrap Iron & Steel Inc. annual meeting in Miami Beach, Jan. 13-16, forecast a continuing heavy demand, both domestic and foreign. "There is not a single foreign buyer of scrap who would not measurably increase his purchases in the U.S. if permitted."

Exports—Adequate support for consumption by domestic steel mills and foundries must come first in the scrap industry, warned Leonard H. Krieger, institute president and head of Southwest Steel Corp., Pittsburgh. If there is an exportable surplus, it should be shared with friendly nations.

An adequate potential of scrap for foreseeable demand is indicated by a census of scrap just completed by Battelle Memorial Institute, said Mr. Krieger. "Not one ton of potential production of steel or castings was lost in 1956 due to a shortage of scrap," he declared.

While prices reached new highs in 1956, Mr. Krieger pointed out that "the Bureau of Labor Statistics' Index of Wholesale Prices shows that increases in scrap were more moderate than those in iron ore, most grades of pig iron, and all finished steel products."

As Others See Us—The iron and steel scrap industry creates a favorable impression almost in direct proportion to the amount of knowledge that people have about it, Dilman Smith, Opinion Research Corp., Princeton, N. J., told the members.

Mr. Smith reported on a public relations survey recently made for the institute. Seventeen per cent of the people covered listed the scrap industry as one of the four industries they knew most about and the same percentage said they were most favorably impressed by the scrap industry.

Conservationists—Use of stainless and alloy steels has increased to such a vast degree that it now behooves every member of the industry to identify and segregate such scrap so that the critical elements it contains can be conserved. Arant Sherman, executive vice president, Alter Co., Davenport, Iowa, speaking on "Salvaging Hidden Values in Scrap," admitted that all yards would not find it feasible to salvage alloys but urged that all should become familiar with their appearance and characteristics so that they may be segregated according to general type and channeled to specialists.

LEONARD H. KRIEGER
. . . re-elected president, ISIS

Closely akin to the nickel base alloys are the forms of commercially pure and alloyed titanium with which the scrap industry is just beginning to develop a familiarity. Although even the manufacturers of titanium have not yet found an easy means to segregate titanium alloy scrap nor are they able to utilize all the titanium scrap presently available, new developments are near which may change that picture. Mr. Sherman mentioned the work Mallory-Sharon Titanium Corp. is doing in developing a new electrolytic process for refining titanium scrap which may make possible the utilization of many grades of scrap which now have no or little salvage value.

Challenge — Greater knowledge of the entire field of new metals and alloys will need to be acquired by the scrap industry, challenged Mr. Sherman.

Steel Spending Up

A record $1.7 billion will be spent in 1957 by iron and steel companies for capital investment

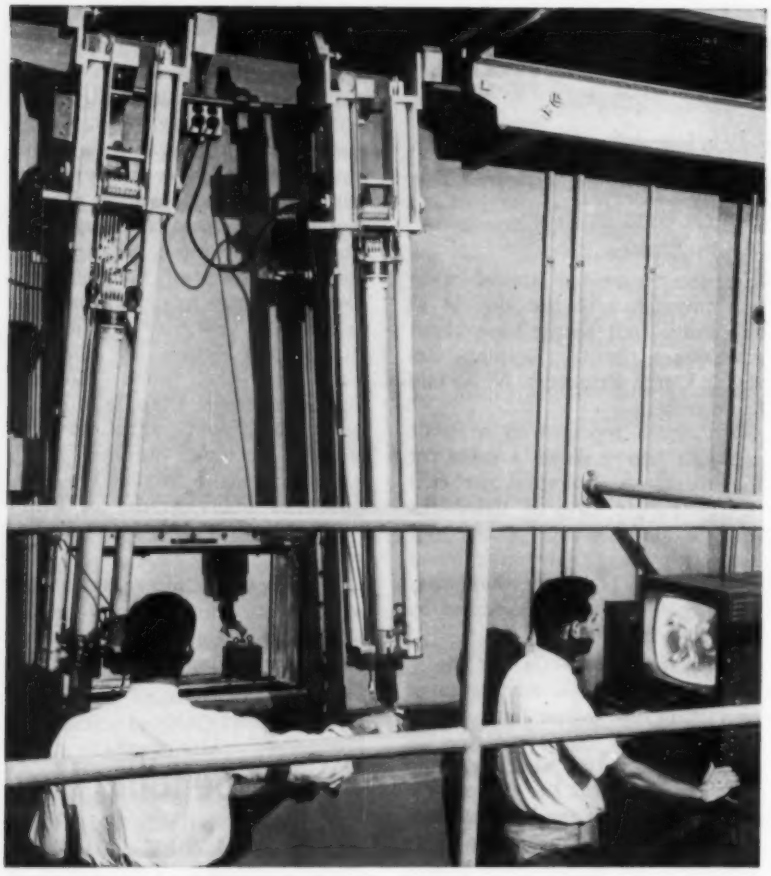
EXPANSION and replacement this year will cost the nation's steel companies 42 per cent more than their 1956 outlay of over $1.2 billion.

The record expenditures follow 11 postwar years, 1946-56, in which $8 billion were poured into new equipment and construction. In four of these years spending reached or exceeded the $1-billion mark.

Despite this, the American Iron & Steel Institute, New York, says the industry will have to continue spending heavily for years to come.

Problem — Executives of iron and steel companies admit they have a serious problem in finding funds for expansion and replacement.

Inflation has increased greatly costs of construction and new equipment. The institute notes there has been a heavy drain on profits to replace obsolete facilities because of inadequate amounts recovered from depreciation.



Closed-circuit TV is useful in Budd Co.'s Nuclear Systems Division hot cell

Budd Enters Nucleonics

The new division fabricates radioisotopes and sells standard and custom equipment for handling the hot stuff. It's a move to cancel out bust cycles of old products

FROM engineering and production viewpoints, Budd Co.'s new division has little in common with its old lines of auto components and wheels and stainless steel railroad passenger cars.

Nuclear Systems Division is reported to be the most completely equipped and staffed commercial activity of its kind in the nation, with facilities to turn out radioisotopes in strengths up to 10,000 curies.

To Diversify—By moving into the commercial nuclear field, Budd is confident it will increase total gross sales and smooth out the cycles of auto and railroad business.

In 1955, about 75 per cent of Budd's sales of $316 million were in automotive work; 15 per cent were in railroad passenger car equipment. Currently, both lines are riding high, but both are subject to more than average fluctuation.

Nuclear Systems also produces radiographic equipment for nondestructive testing of metals and other materials, an outgrowth of Budd's purchase of Gamma Corp., Mansfield, Mass., more than a year ago. Dr. Arthur J. Stevens, who headed Gamma, is in charge of the new division.

Other moves in Budd's diversification program: 1. Acquisition of Continental-Diamond Fibre Co., Newark, Del., producer of vulcanized fiber, laminated plastics and insulating materials. 2. Fabrication of stainless steel parts for jet engines and airframe research.

Facilities — Nuclear Systems is located near Budd's Philadelphia headquarters on Hunting Park avenue, in a building originally constructed to test combat tanks with x-ray equipment. In sections, the concrete walls are four ft thick. In the radiation proof chamber of the building, master slave manipulators (mechanical arms and hands) handle the hot stuff while technicians observe through a 36-in. thick window of high density glass. Closed circuit television provides another means of observation (see photo).

The division fabricates many types of radioactive sources: From small beta sources used in gaging equipment to extremely potent kilocurie gamma sources for research irradiation and therapy. Some of the materials used: Cobalt 60, cesium, thulium and iridium. They are made in wafer, pellet, rod and other forms; then encapsulated in specially designed containers for storage and shipment.

The Markets — Radioisotope sources will be used to study the influence of high intensity radiation in many fields, Budd believes. The outlook is attractive in petrochemicals and chemicals, where high intensity radiation may bring new products and improvements in old products. For example, polyethylene becomes stronger after subjected to radiation; it is also more heat resistant and less soluble. The effects of radiation on metals is promising for the aircraft industry, and metalworking as a whole.

Other markets: Food processing, brewing, pharmaceuticals, antibiotics and rubber. Radioisotopes are used by 2500 medical and public health centers in this country.

There are three general categories of potential industrial applica-

tion: Cold sterilization pasteurization, the initiation of chain reactions and the alteration of molecular structures.

Equipment — Nuclear Systems offers standard and custom equipment for shipping, storing and containing radioactive sources. Custom jobs will cost from $25,000 to $250,000 and can be delivered and installed in eight to 12 weeks.

Standard equipment for gamma radiography is available almost from stock. Similar to x-ray, gamma equipment uses tiny, self-contained nuclear sources for inspection of heavy castings, weldments and fabricated parts. One man can easily handle these machines, which cost a fraction of equivalent x-ray machines, Budd says. Short exposure times are possible because of the powerful gamma sources.

On Hand—In lead lined wells sunk deep in the concrete floor of Nuclear Systems' hot cell, there is now more radioactive material (10,000 curies of raw cobalt) than in any other private installation in the U.S. Budd Co.'s new division is ready for business.

Kaiser Starts Aluminum Plant

Aluminum sheet has started to roll from the first operating units of Kaiser Aluminum & Chemical Corp.'s $200-million works at Ravenswood, W. Va.

Cold-rolling facilities, along with annealing furnaces, slitters, shears and other auxiliary equipment for turning out light-gage sheet are in production at the Ohio river plant. At present, rough reroll stock from Kaiser's rolling mill at Trentwood, Wash., is being used.

The Ravenswood foil mills will start production in a few weeks. Ingot casting facilities and the rolling mill's hot line are expected to began operations late this summer. Metal from the first potline of the reduction plant will be poured at about the same time.

When completed in 1958, the plant will employ 4000 workers.

Brake Shoe To Build

American Brake Shoe Co., New York, is starting construction of a $3-million plant in Le Roy, N. Y.

Continental Gin Expands

It will spend $5 million, including $875,000 for machine tools, to diversify still more. It's considering buying two electric furnaces to provide steel for castings

A $5 MILLION expansion to broaden its diversification is being launched by Continental Gin Co., Birmingham.

The company, long noted for its cotton ginning machinery, is aiming at supplying equipment for the chemical and wood pulp industries in addition to extending its activities in the material handling field.

To Buy Tools — The expansion will necessitate purchase of $875,000 worth of machine tools.

The company's largest plant, at Birmingham, will be opened to production of equipment other than cotton ginning machinery. Ginning equipment will be made at the company's Prattville, Ala., and Dallas plants, with the Prattville plant accounting for 75 per cent of it. The company's Memphis, Tenn., and Atlanta plants will be service and spare parts plants.

Diversification — Continental Gin's industrial division, formed in 1936, has been making machine tools on subcontracts but it makes conveying, elevating and power transmission equipment under the Continental Gin name. The company began diversifying in 1936 when the government reduced this country's cotton acreage.

In expansion of its diversification, Continental Gin is considering the production of steel castings at Birmingham. To provide the steel, the company would install two electric steelmaking furnaces. The Birmingham plant already has an iron foundry. Present products of the company would take 30 per cent of the steel castings; 40 per cent would go into new products the company will produce; and the remaining 30 per cent would be for sale on the open market.

New Assignments—In preparation for its expansion, Continental Gin named George C. Morgan as vice president in charge of its industrial division and Nelson J. Kemp as vice president in charge of finance. Mr. Morgan joined Continental Gin in 1936. His assignment immediately prior to becoming a vice president was that of manager of the industrial division. Mr. Kemp joined Continental Gin in 1948. Since 1951 he has been treasurer, a position he will continue to hold.

Spark Plug—A principal figure in the operation and expansion of Continental Gin Co. is Robert S. Lynch, who also is chairman of Atlantic Steel Co., Atlanta. He has been on Continental Gin's board of directors five years, and has been chairman and chief executive officer since September, 1955. President of Continental Gin is Merrill E. Pratt.

Spreading Out — Diversification puts 40 per cent of the company's business outside cotton ginning machinery. Nevertheless, the company remains the world's largest single producer of complete cotton ginning systems. Its gross sales were $15.5 million in 1955 and $17.3 million in 1956. It has no debt.

The company employs around 2000 people in its factories and more than 400 in its offices.

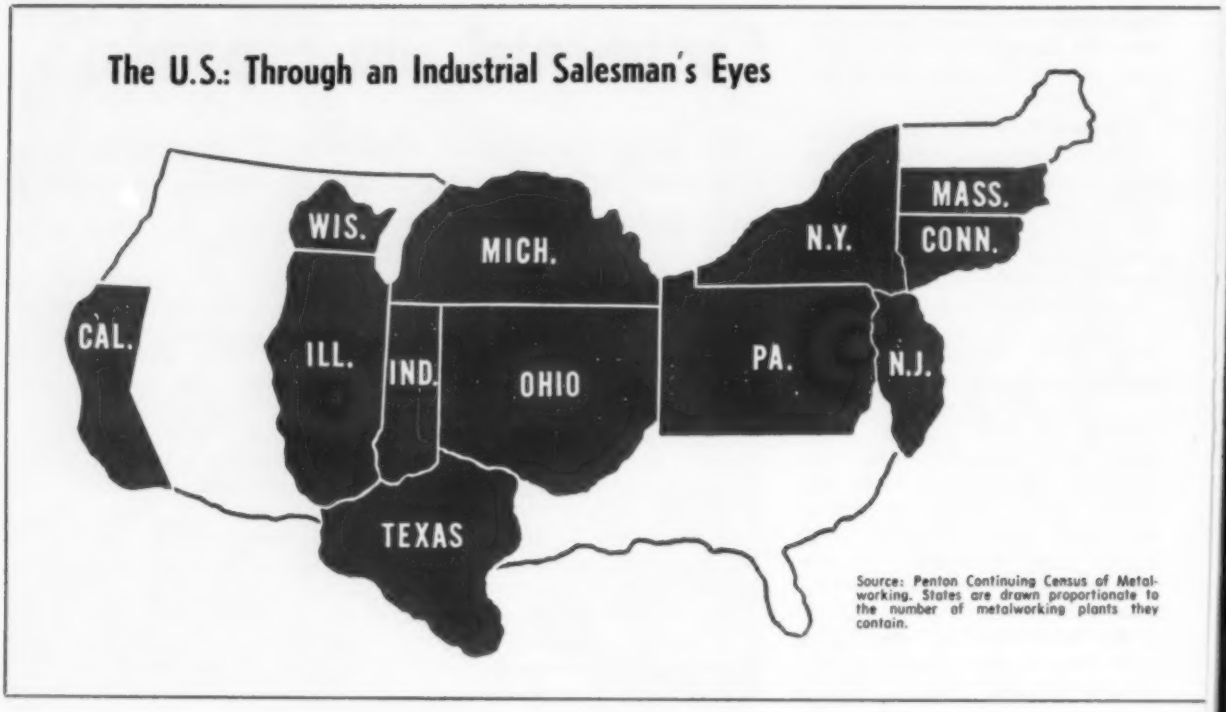
Expands Zirconium Production

National Lead Co.'s Titanium Alloy Mfg. Division facilities at Niagara Falls, N. Y., are being expanded to increase production of zirconium oxide and zirconium silicates.

A new building will house mills, pulverizers, mixers, dryers and tanks. Completion is scheduled for July 1.

Canadian Zinc Firm Invests

A $1,630,000 modernization program is scheduled for Consolidated Mining & Smelting Co. of Canada's zinc plant in Trail, B. C. The installation is expected to be completed in about 18 months.



Check Your Territories

One sales manager's advice: "We need less time on the road; more time to see the big picture." Don't let your territory map gather any more cobwebs than necessary

CLEVELAND Pneumatic Tool Co., Cleveland, may soon open a sales office in the Denver-Salt Lake City, Utah, territory. Towmotor Corp., Cleveland, divided Florida into three territories this year. Basic Inc., Cleveland, is considering opening a Birmingham office.

Those companies are realigning their sales territories to take advantage of new markets. How long has it been since you reviewed your territory setup?

Perspective—The map above won't tell you it's about as far from Dallas to St. Louis as from St. Louis to Youngstown. It will tell you the relative concentration of metalworking plants in the seven states between Dallas and Youngstown. It's one tool which will help you learn how to look at the market for your product.

Other tools: U.S. census data on population and manufacturing; government publications like "Statistics and Maps for National Market Analysis," "Distribution Data Guide," "Business Statistics," "Survey of Current Business," "County and City Data Book" and "County Business Patterns"; Hagstrom's "Industrial Area Trading Map." (First published in 1947, a new edition will be available no later than May 1, 1957; contact Hagstrom Co. Inc., 311 Broadway, New York 7, N. Y. It will consist of 110 U.S. trading areas.)

Boil them all down and you have three principal areas of information to consider: 1. The plants you sell to. 2. Total population. 3. Industrial employment.

Firsthand — Companies which don't sell across-the-board products have other approaches, too. Cleveland Pneumatic Tool supplies components to the aircraft industry. Government statistics don't do the firm too much good, reports John Brogan, sales manager, because aircraft plants are found in a few major locations throughout the nation. Mr. Brogan counts on aircraft industry sales figures and firsthand reports from customers (on new plant construction) to guide his territory setup.

Towmotor also varies the statistical approach. R. L. Fairbank, sales manager, notes that many lift trucks are sold outside the manufacturing business, so Towmotor instructs its salesmen to scan their territories for all possible outlets.

Virgin Area—Many territorial changes are in the works for Florida and the Northwest. **Consensus:** The sales manager must keep his ear to the ground for rumblings of new area developments; then have the courage to realign his territories to cover the new markets. Many firms are not in a position to pioneer new areas, but they must be prepared to exploit them whenever and

How To Get Good Territory Coverage

1. DIVIDE your territories. Start with a map and past sales records of your company and your competitors.
2. FOLLOW business growth trends. See where you now have most of your sales. Gather forecasting data.
3. KNOW your territories: Special problems in distribution, transportation and personalities.
4. FIT your salesmen to their territories: By the needs of the territory, by experience and dependability.
5. HELP salesmen in new territories. Develop complete market surveys. Let your salesman share in your decisions.
6. ROUTE your salesmen. Show them how to cover the territory most economically and efficiently.
7. RE-EVALUATE your territories periodically, considering all factors bearing upon their organization.

Source: C. C. Crawford, management consultant and professor, University of Southern California. Dr. Crawford recently conducted a workshop on sales management for Institute of Sales Research, Pasadena, Calif. The above points were suggested by 75 sales managers and salesmen as most important to good territorial coverage.

wherever they seem to be developing.

B. G. Krause, sales manager, Air Controls Inc., Cleveland, now has a salesman covering Florida alone, where the state was once covered from Atlanta. New markets can bring new problems, however.

Freight Rates—With freight rates climbing, many companies are questioning the wisdom of shipping beyond certain limits. The territory you serve may depend on the percentage of total costs represented by freight charges.

The question: If freight rates get out of hand, do you build new plants closer to your market, or reduce company operations to a regional basis, trying to gain in depth what you once had from broad coverage?

Evaluation—Business paper aids and government statistics give you a point of view for your territory setup; association reports can bring you down to earth. Industrial controls manufacturers provide National Electrical Manufacturers Association with their sales figures. NEMA breaks those figures down by products and provides its members with quarterly industry reports on 36 of the Hagstrom trading areas. Annually, NEMA reports on 96 of the areas. Firms like Clark Controller Co., Cleveland, learn total industry sales and their own percentage of the total.

Robert Whitehill, general sales manager, comments: That information, plus value added by manufacture, county industrial employment and general population, gives Clark Controller the best picture possible. By using more than one source of information, errors in evaluating particular districts tend to cancel themselves out.

The Point—Sales territories symbolize company policies in the broadest sense. As company policy shifts to meet changing conditions, territory alignments must be equally fluid.

Notes one sales vice president: "Three years ago we were in the red, while our industry was booming. Our salesmen and district managers (who averaged five years in their territories) had come to regard their districts with an air of possession that allowed for few improvements." Top management finally forced through a major shakeup of territories to put the firm on the road to profits.

Re-evaluation—Formal plans of reviewing territory setups are not too prominent in metalworking, although most companies agree with Mr. Krause of Air Controls: "We're watching our men's performances closer than ever before."

Cleveland Pneumatic Tool does have a formal program. Early in September plans are laid for the following year, including territory realignments. The firm's five-year plan is reviewed quarterly. Four principal factors considered: 1. Profits. 2. Potential. 3. Competition. 4. Geography.

Noble B. Clark, sales manager, machine tool division, Warner & Swasey Co., Cleveland, says, "We have a continuing program of reviewing our territory boundaries." But drastic shakeups are probably necessary only under extreme conditions, believes Mr. Whitehill of Clark Controller:

1. In cases such as when U.S. Steel Corp.'s huge Fairless Works changed Trenton's (N. J.) trading habits. 2. When a firm shifts from independent reperesentatives to company salesmen. 3. When two companies merge.

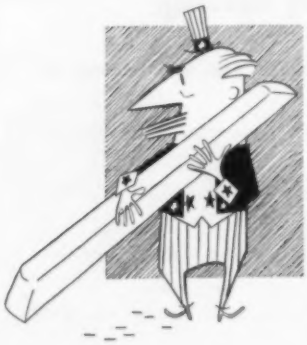
Mr. Clark cites another point of view: "Our territories grow with the man. If we have a good man in Pittsburgh, we'll give him some more counties from the Cleveland territory."

Payment—Although most firms consider commission payments of high incentive value, companies with straight salary salesmen have an easier time realigning territories. Harvey Barrett, vice president-sales, Basic Inc., believes: "Without commissions we have fewer problems. For example, in the case of multiplant accounts, it's difficult to tell who did the work. There's also a great deal of missionary work in this business."

In the case of independent salesmen on a commission basis, the problem is a little different. The object is to give a man the smallest territory possible where he can devote 100 per cent of his time to your line.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

U. S. Plans Firmer Grip On Nickel Distribution



WASHINGTON is going through the motions of clamping a firmer hand on nickel distribution. All-out controls definitely are not in the wind, but a closer check will be kept on where the metal is going. Commerce department, in a report to the Joint Congressional Committee on Defense Production, predicts a continuing shortage of nickel, lasting as long as 1965. That statement represents a change in approach. In the past, Commerce has consistently emphasized that present nickel allocation policies by producers and distributors are as good as can be had.

What Commerce Department Hopes To Do

The department has been under fire from several sources for not keeping a tighter rein on the civilian nickel supply. Numerous small users, particularly platers, were complaining. So here's what Commerce plans to do: 1. Work with International Nickel Co. to make its present base period system (1948-1950) more flexible to allow for shifts in consumption, technological advances and new uses. 2. Try to work out with plating industry suppliers a fairer distribution setup. 3. Keep closer watch on distribution, especially when production from the government-owned Nicaro, Cuba, project comes on the market for nondefense use. 4. Submit a report to Congress about Feb. 1 on progress in smoothing out plating industry distribution.

Military Use of Nickel Climbs

That the Commerce department has taken on quite a job for itself is evidenced from other parts of its report: 1. Defense is currently taking more than one-third of supply, and that take will continue to increase (military consumption was up 31 per cent in 1956 over 1955). 2. The military has consistently underestimated requirements; getting the Pentagon to figure more closely will continue to be a problem. 3. Commerce, in effect, endorses continued diversion to industry of stockpile-destined nickel, indicating that relief for civilian users is still far off.

Metal Stirs Government Controversy

The nickel situation is made even trickier because of disagreements about it among Washington officials. In November, Defense Secretary Charles Wilson appealed to industry to do all it could to cut back on nondefense consumption of nickel. That came despite an Office of Defense Mobilization report in August by Dr. John R. Townsend which pointed out that military and civilian efforts to conserve the metal had reached the point of diminishing returns.

More Missile Business

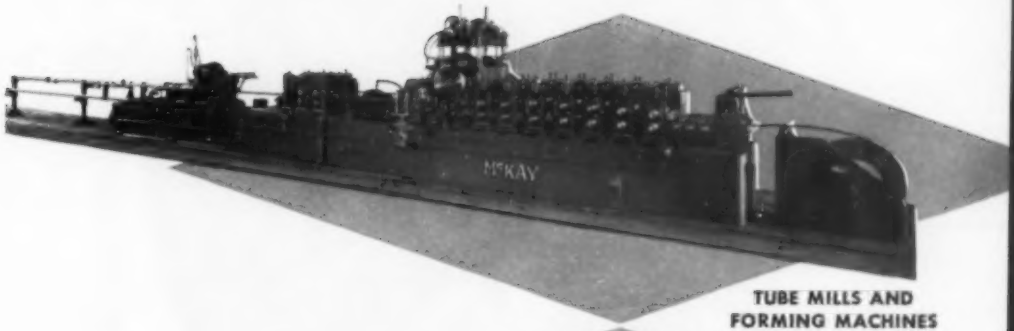
Three ballistics missile contracts totaling $570.5 million have been awarded by the Air Force. The cost-plus, fixed-fee contracts cover design, fabrication and testing for the Atlas ($145 million to Convair Division of General Dynamics Corp.), the Titan ($358 million to Glenn L. Martin Co.) and the Thor ($67.5 million to Douglas Aircraft Co.).

Straws in the Wind

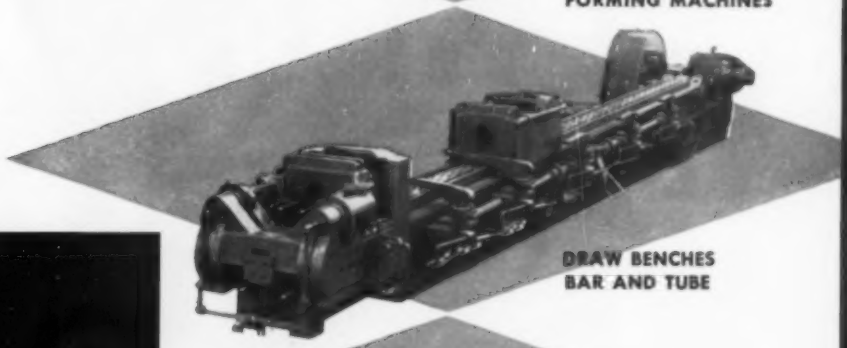
• Westinghouse Electric Corp. will be allowed by the Atomic Energy Commission to build a nuclear test reactor about 29 miles southeast of Pittsburgh.

• Setasides of steel, copper, aluminum and nickel alloys for defense orders will edge up in 1957's second quarter. Steel, aluminum and nickel alloy allotments will be 2 per cent higher than in the first quarter. Copper will be up 14 per cent. Amounts are: Aluminum 123.1 million lb; copper 45.1 million lb; nickel alloys, 9.9 million lb; steel 561,619 tons.

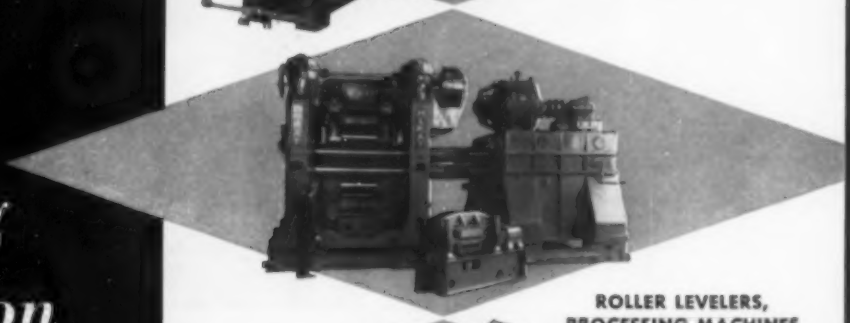
Meet F. Price Norris Jr: He's serving as director, Iron & Steel Division, Business & Defense Services Administration. Mr. Norris is on leave as assistant to vice president, sales, Allegheny Ludlum Steel Corp. He can be reached in Washington at Commerce department, room 4812. Phone STerling 3-9200, ext. 4412



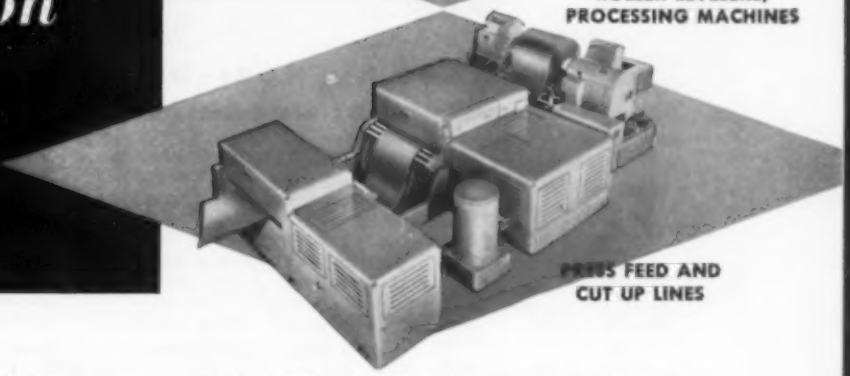
TUBE MILLS AND
FORMING MACHINES



DRAW BENCHES
BAR AND TUBE



ROLLER LEVELERS,
PROCESSING MACHINES



PRESS FEED AND
CUT UP LINES

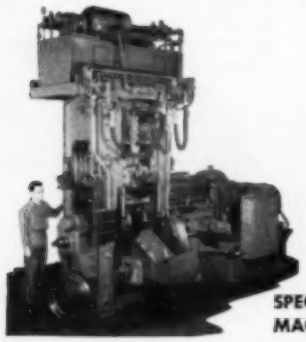
Metal working Automation in action...

If you're in the metal working business, you should be acquainted with McKay *automated* lines available for many metal working operations.

McKay pioneered and has played a leading role in the development of such equipment as that pictured on this page.

Basic McKay designs can be modified, or special machines developed to meet specific requirements.

THE McKAY MACHINE CO., YOUNGSTOWN, OHIO



SPECIAL
MACHINERY

104

McK

As time goes by, Rust-Oleum long wear assures lower cost over-the-years protection!

Rust-Oleum is distinctive as your own fingerprint. Accept no substitute.

Rust-Oleum's *unusual* resistance to extremes in rust-producing conditions—from sun and salt water to humidity, moisture, fumes, and weathering—assures you of lasting beauty. Long wear made possible, because Rust-Oleum's *specially-processed fish oil vehicle* works down through the rust into the tiny, microscopic pores in bare metal to STOP RUST. Important savings are realized by applying Rust-Oleum 769 Damp-Proof Red Primer *over rusted metal* after scraping and wire-brushing to remove rust scale and loose rust—as costly surface preparations are usually eliminated. See how Rust-Oleum can save you money... in your plant, or your home. Prompt delivery from Industrial Distributor stocks. Write for illustrated literature with color charts.

RUST-OLEUM CORPORATION • 2511 Oakton Street • Evanston, Illinois

RUST-OLEUM®

MANY ATTRACTIVE COLORS

Rust-Oleum finish coatings in Aluminum, White, Red, Gray, Green, Blue, Black, and Yellow provide double protection for tanks, machinery, girders, equipment, metal sash, wire fences, etc. Write for illustrated literature with color charts.

STOPS RUST!®

Rust-Oleum and Stops Rust are brand names and registered trademarks of the Rust-Oleum Corporation.

Radioactive tracing studies prove Rust-Oleum penetration through rust to bare metal.

Kleinoder: Job Stampers Can Succeed

"OUR PRECISION metal stamping business should show sales gains of 50 per cent during the next five years," predicts Jack Kleinoder, secretary-treasurer, Volkert Stampings Inc., Queens Village, N. Y.

Why?—The small job stamper has three distinct advantages, reports Mr. Kleinoder. He can: 1. Give individual and prompt service. 2. Reply immediately to customers' inquiries (questions go directly to decision makers). 3. Keep promises (compactness and operational flexibility help assure this).

Cost—Volkert, formerly a tool and die shop, puts emphasis on quality. "We feel," says Mr. Kleinoder, "that we make superior tools and dies which enable us to produce quality results at competitive prices. But," he adds, "we like to educate our customers to think in terms of what it costs them to install our stampings in the finished assembly (what labor costs are involved, how many rejects turn up). When we can get customers to think along these lines, they get the complete story on how much a stamping costs.

A sales engineering service is used instead of a sales force at Volkert. "We try to solve the individual's particular problem," Mr. Kleinoder relates. "We seldom take an order for a new part without engineering it first."

Consultants—"We like to act in this capacity," explains Mr. Kleinoder. "Sometimes we spend from 12 to 15 months ironing out all the bugs for a particularly intricate stamping so that we know it will work before spending thousands of dollars making the necessary dies." Result: Volkert is often more conservative than some of its customers, who want to go ahead and try preliminary designs. "Our reluctance to plunge into a job helps us develop customer confidence. It helps us keep the inside track for contracts, too," says Mr. Kleinoder.

Future—Employing 180 persons, Volkert has established its own four-year apprentice program for tool and die makers. Nine employees are enrolled for some 8000 hours of training. Plans call for one third to be graduated each year. Complete program cost: From $2500 to $3000 for each man. Explains Mr. Kleinoder: "As each year passes, the man carries more of his own weight. By the fourth year he is operating on the profit side of the ledger."

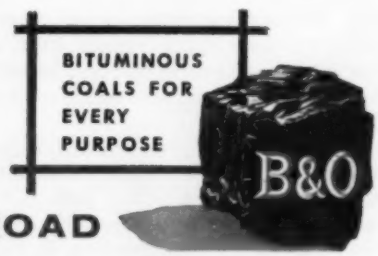
He adds: "The training program is just one of our approaches to getting ready for more sales. Even though we are small, we feel that it is the moral obligation of every metalworking company to help train more apprentices. We know we may lose a few of them, but others will benefit. If all manufacturers, large and small, would develop training programs, everyone would gain."

➔ Take a long look into the future. You'll see constantly growing industrial activity and millions of tons of *power-packed* Bituminous produced to sustain it, with *billions* still in reserve! B&O is a keystone to this vital supply and demand. The coal fields it serves hold proved, usable reserves of billions of tons of Bituminous for every purpose.

Today, tomorrow or decades ahead you may be sure that B&O Bituminous can be *your* best source of stable-low-cost power. It will pay you to use this *fuel with a future* NOW! *Ask our man!*

CONTACT OUR COAL TRAFFIC REPRESENTATIVE!

You'll receive details in the most efficient, low-cost Bituminous coal for your particular requirements.
COAL TRAFFIC DEPARTMENT B&O RAILROAD
Baltimore 1, Md. LExington 9-0400



BALTIMORE & OHIO RAILROAD

Finish broaching internal running gears at Warner Division, Borg-Warner Corp.

Gains Ahead in Cutting Tools

CUTTING TOOL manufacturers expect the market for their products will increase 2 to 5 per cent in 1957.

The tool industry has plenty of capacity to handle this increase. As a result few physical expansions are planned, but many companies plan to boost capacity by adding newer machines and upgrading handling and manufacturing methods.

That's the word from Leonard H. Skoglund Jr., president of the Cutting Tool Manufacturers Association, Detroit, and vice president of Skully Jones & Co., Chicago.

Cautions Mr. Skoglund: "We have been in a highly competitive period. Everyone may not be as busy this year. It's possible some shops will be forced to curtail operations."

Who's Who—Between 400 and 500 companies in the U.S. make cutting tools for boring, drilling, broaching, tapping and similar operations. Some 150 of them are on the CTMA roster. Power hand tool and abrasive manufacturers are not included in the membership.

In addition, there are another 500 or so one and two-man job shops and specialty firms. Their number is growing steadily as more small outfits start up each year. Many of them are offshoots of established manufacturers.

Mr. Skoglund points out the cutting tool business primarily is made up of family owned companies. This tends to make it a tight lipped operation where competitors are concerned.

Bread 'n' Butter—"Although the automobile business is the heart of the cutting tool market, tool use in the aircraft industry has almost tripled since the end of World War II," says Mr. Skoglund. He excludes boom Korean War years from this estimate.

Other major users include the machine tool and farm implement industries and appliance makers. Cutting tool manufacturers themselves are large users of their own products.

Adds Robert Murdock, president of Murdock Tool Co. Inc., Detroit, and vice president of CTMA: "With the passing of the federal road bill, the road building machinery industry should show a vast improvement (in cutting tool sales) shortly."

Future—Guided missiles and gas turbine engines are making use of high temperature resistant metals which will call for greatly improved cutting tools.

This may be the industry which will make ceramic tooling come into its own.

Mr. Skoglund suggests: "We think ceramics are going to be a major factor in the cutting tool field. Manufacturing improvements in ceramics should substantially reduce costs."

Ceramics — His thoughts are echoed by K. R. Beardslee, general manager of General Electric Co.'s Metallurgical Products Department, Detroit, who reports that cemented carbide output will be up almost 9 per cent over last year.

Mr. Beardslee says the consumption of cemented carbide metals for cutting tools and other uses has been increasing at a 5 to 8 per cent annual rate since 1950. The GE division expects sales of its carbides to be about 12 per cent higher this year.

Upgrading — With prospects of a better year ahead, the industry faces a constant problem of finding manufacturing short cuts and better materials to meet the constantly rising demand for higher tool speeds and longer tool wear time at a competitive price.

BULLARD

Announces the acquisition of the

HYDRA-FEED Lathe

(FORMERLY MANUFACTURED BY HYDRA-FEED MACHINE TOOL CORPORATION)

AVAILABLE IN THREE MODELS TO MEET A WIDE RANGE OF REQUIREMENTS

FEATURES

Unobstructed front view design allows faster loading and unloading . . . easier set-up . . . with less operator fatigue.

When used as a tracer lathe templates are above work piece where dirt, chips and cutting oils cannot interfere with work accuracy.

Oversized chip chute with pan below the entire work area . . . readily accessible from end, rear or bottom of machine.

Massive strength and rigidity with extra power to take full advantage of maximum feeds and speeds obtainable with multiple carbide tooling.

THE BULLARD COMPANY

286 CANFIELD AVENUE — BRIDGEPORT 9, CONNECTICUT

Please send me a copy of the

BULLARD HYDRA-FEED CATALOG

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Auto Expansion Spreads Out

EXPANSION in the auto industry will be concentrated in Great Lakes states and to a lesser extent on the West Coast. Detroit area will continue to be a nerve center for the business.

That's the consensus of a study released by the Detroit Regional Planning Commission. Conducted under federal auspices, the study indicates future growth trends for car builders.

"I don't think any more major auto plants will be built in the Detroit area. It may, however, grow as a center for the electronics industry," says Paul Reid, commission chairman.

Westward Ho — Continues the study: "If a subsidiary manufacturing complex were to develop outside the East North Central Region, it would be most feasible in California.

"Small parts and equipment manufacturers have been established there within the last few years. Steel also is being produced in California. West Coast steel output would increase if the market for it increased within that area."

Top industry staff men point out that auto makers have hesitated to rely on West Coast steel because its pricing policies are less stable.

In addition, the use of taconite and jasper coming from the Mesabi and Ishpeming iron ore ranges insures a steady supply of ore into the Great Lakes. Ores from the Labrador mines also can be imported through the St. Lawrence Seaway, says the commission report.

Confirmation — The study confirms the obvious fact that assembly plants are growing in major marketing areas while manufacturing facilities will continue to be centralized close to sources of supply and transportation (see map above).

"The industry has entered upon a building program which probably will suffice through 1960. In most instances, capacity production in newer plants will not be reached even with the output of 8 million cars per year," asserts the study.

It adds that automation will be a factor in centralizing manufacturing operations. "It takes only one or two automated engine casting and assembly lines to supply all engines needed for final assembly. Automation requires huge capital investment which hinges on larger market demand. There's little need for duplicating such operations," says the report.

By-passed — The commission doesn't mention a few points that add weight to its conclusions. It's estimated there's less than 1000 acres of industrial land left in met-

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

ropolitan Detroit. High wage rates plus a scarcity of skilled labor make it imperative that auto manufacturing operations move into other areas.

It's only natural they seek centralized locations near inexpensive transportation. Detroit may have muffed its chance because the city has no concrete plan for developing a major seaport when the St. Lawrence Seaway is completed. Ohio ports are taking such steps.

New Area — The study also doesn't mention that the Southwest has almost doubled in manufacturing capacity and has had more than a 30 per cent population boost in the last five years.

This area is ripe for auto assembly plants and car builders have indicated they would like to build up a circle of small, dependable supplier companies around such facilities.

Employment—Probably the biggest indicator of the outward push comes from employment statistics quoted in the report. Detroit regional employment has decreased almost 5 per cent since 1950. This area comprises the bulk of Michigan auto employment or about 35 per cent of the total industry labor force.

On the other hand, Indiana has had a 30 per cent increase in automotive employment since 1947. Wisconsin has gone up 27 per cent, Ohio 22 per cent and Illinois 12 per cent.

Additional assembly plants have boosted California to fifth place in auto labor circles. Auto employment in California has increased 117 per cent since 1947.

Hedge on Steel Buying

Latest roundup of reports from steel companies shows auto companies still are not confirming orders as rapidly as had been expected.

As a result, many steel firms say they have fairly large supplies of cold-rolled sheet on hand. There also seems to be a fair amount of hot-rolled products available.

High mill supplies are blamed for the pinch on steel warehouse sales.

While mill orders have just been trickling in from auto plants, purchasing agents are admitting that industry inventories are down to rock bottom. It's understood one Fisher Body division has less than a 30-day supply of steel on hand for its stamping operations.

Change Due — The hedging on steel orders is making mills overly pessimistic. Some steel men have been saying car output won't come up to predicted 1957 levels of 6.5 to 6.8 million.

While 6.8 million does seem too high, current boosts in first quarter output schedules show that the auto industry will be back in the market shortly.

L. L. Colbert, Chrysler Corp. president, says his company will increase its first quarter production by 26.6 per cent over 1956's first quarter total of 251,074 cars.

Station wagons will account for 13.4 per cent (45,000 units) of this production boost, adds Mr. Colbert. Chrysler has been plagued with manufacturing problems which has kept it from turning out enough wagons to meet dealer demands.

Contender — Lincoln Division, Ford Motor Co., also is scheduling first quarter output some 22 per cent over the same 1956 period. Lincoln turned out 14,096 cars in the first three months of last year.

Ford's Mercury Division announced similar plans earlier. F. C. Reith, Mercury's general manager, reports his division will up January car building 43 per cent over December totals of 28,000.

U.S. Auto Output

	Passenger Only	
	1956	1955
January	611,190	659,508
February	554,667	675,495
March	575,559	794,015
April	547,766	753,851
May	471,994	724,892
June	430,141	649,393
July	448,804	659,763
August	401,997	614,493
September	190,709	461,591
October	388,922	517,813
November	581,088	749,061
December	597,083	682,257
Totals	5,799,920	7,942,132
Week Ended	1956	1955
Dec. 15	158,431	169,256
Dec. 22	154,832	150,881
Dec. 29	99,577	105,670
	1957	1956
Jan. 5	91,130	125,245
Jan. 12	145,652†	149,995
Jan. 19	148,000*	144,729

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Buick Compressor Plant

Buick Division of General Motors is building an air compressor plant at Flint, Mich., which will have a capacity of 120,000 cu-fpm, reports Jesse L. Powers, general manufacturing manager.

This announcement ties in with earlier rumors that Buick and Pontiac divisions are investigating the possible use of more air powered tools on manufacturing and assembly lines.

"Compressed air has become an important power source in automobile production," says Mr. Powers. He adds that Buick used more than 20 billion cu ft of compressed air in 1956.

Ford Management Changes

Ford Motor Co. has broken down three of its basic manufacturing divisions into six smaller divisions. The three divisions formerly made up one manufacturing group.

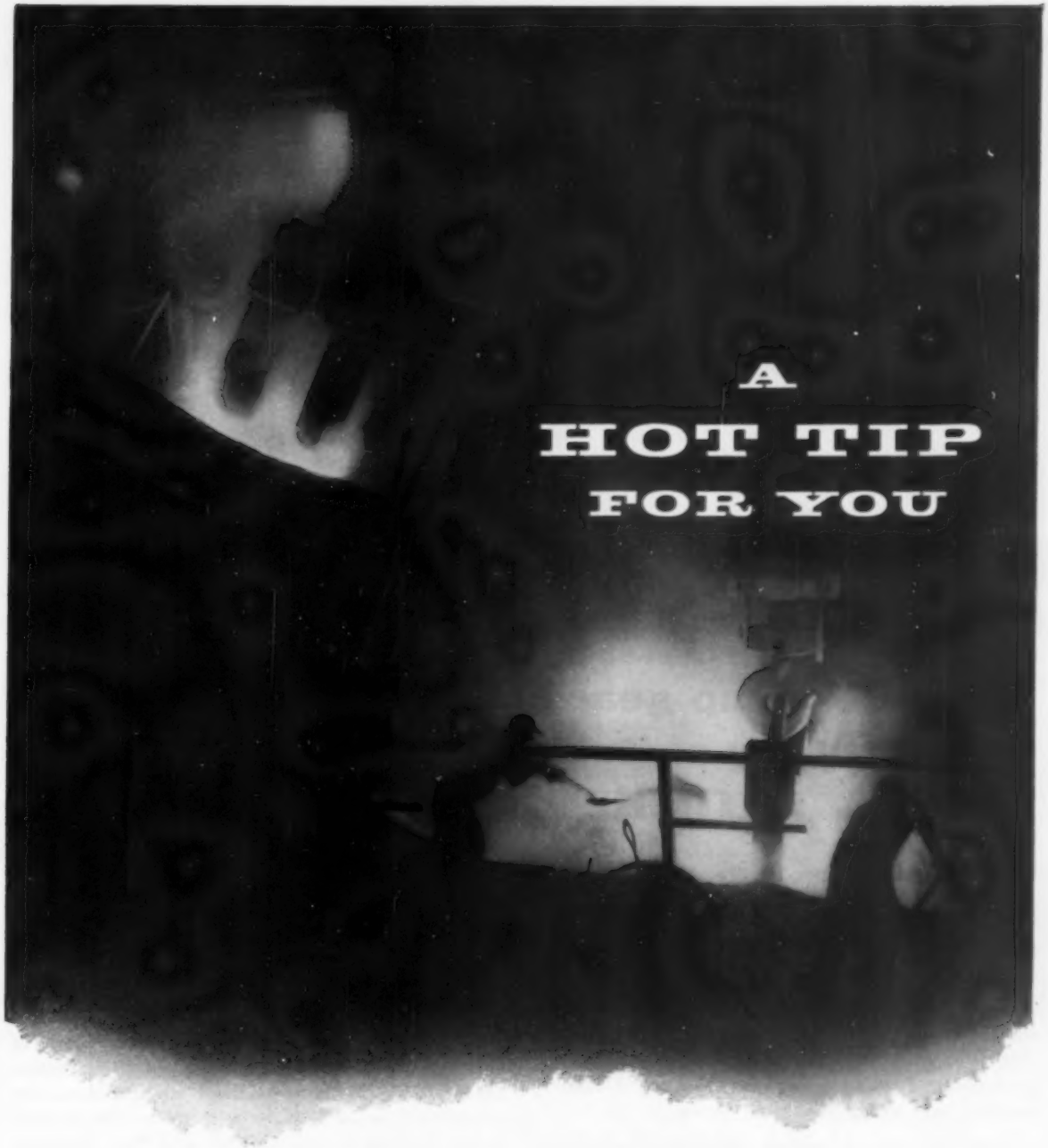
The parts and equipment manufacturing division has been established as a separate group and will contain two new divisions, hardware and accessories. J. S. French will be the group executive.

Ford's metal stamping division also has been set up as a group under the head of A. J. Hole. It's broken into a frame tool and die division and a stamping division.

The former engine and foundry division now is a group and consists of separate engine and foundry divisions. C. H. Patterson has been appointed group executive.

Exhaust Notes

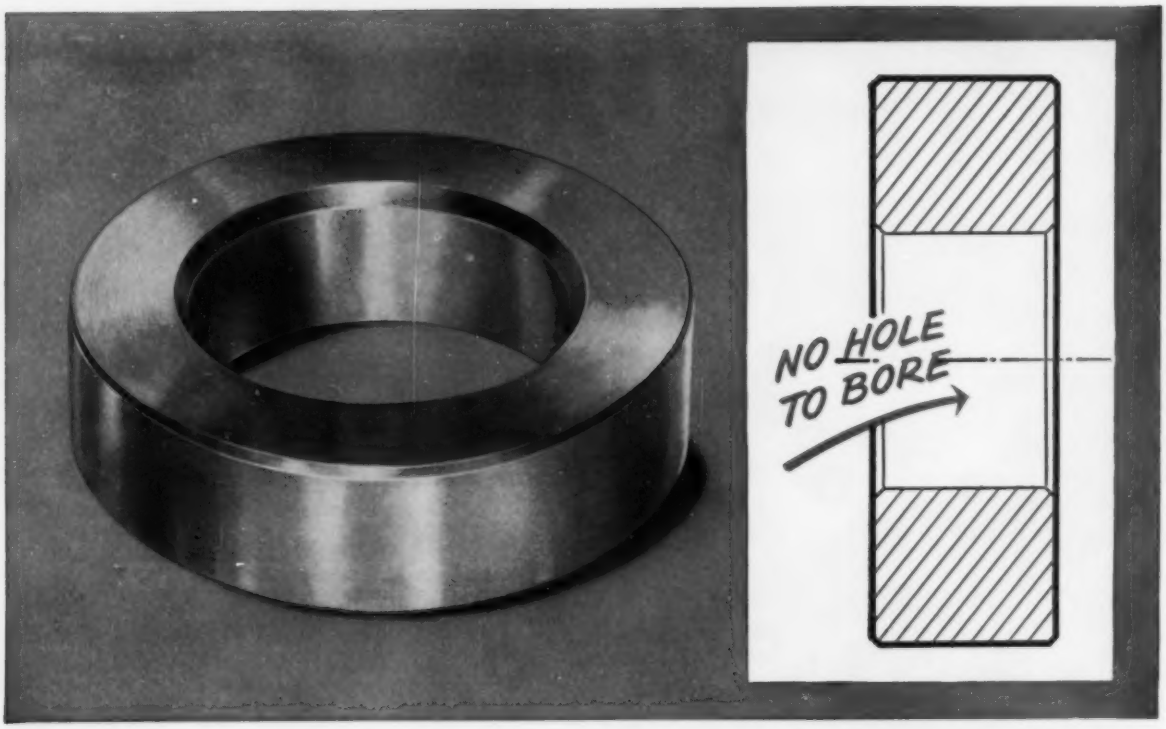
- Chrysler Corp. expects that two-door and four-door hardtops will account for almost 39 per cent of all cars built by the company in 1957.
- Heading into the first quarter, General Motors is accounting for 47.8 per cent of total industry production. Ford is taking 31.2 per cent, Chrysler Corp. 18.6 per cent.
- Chrysler of Canada reports it has invested $55 million in new plants and equipment in the last three years. Canadian car population may triple by 1987.



● Electric arc furnaces represent the greatest degree of refinement of any steel-producing method. More rigid metallurgical controls are possible in the electric furnace and, therefore, assure you the highest, most uniform quality in your steel. A leader in the use of the electric furnace, Copperweld offers the most diversified selection of hot-rolled blooms, bars and billets of both leaded and unleaded alloy and carbon steels.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY
Steel Division • Warren, Ohio
EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N.Y.



Steps up gear blank production 300% by switching from bar stock to TIMKEN® steel tubing

AN engine manufacturer felt that his gear blanks were costing him too much to make. The center hole had to be bored out of solid bar stock. It took a whole hour to turn out 29 blanks. And a lot of steel was wasted in the process.

So the manufacturer discussed his problem with metallurgists of the Timken Company, experts in fine alloy steel. After study they recommended a change in production methods together with a switch to Timken® seamless steel tubing in place of bar stock.

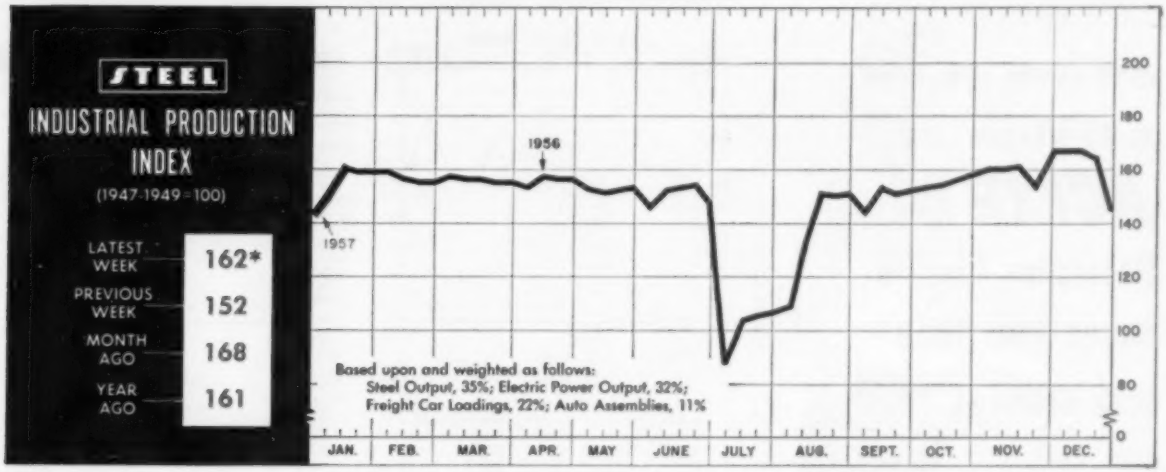
With Timken seamless steel tubing, the center hole is already there. It doesn't have to be bored out. Finish boring was the engine maker's first production step. And with Timken steel tubing his gear blanks are now being turned out at 120 to 130 an hour—an increase of 300%.

Machining costs have been cut by more than half. And because the center hole is "built-in", no steel is wasted.

The files of the Timken Company contain records of hundreds of problems that have been solved by Timken fine alloy steel. If you have a tough steel problem, why not bring it to us? Wire, write or phone The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Jan. 12.

Business Climate Set for More Boom

THE BUSINESS scoreboard shows 5 to 3 in favor of continuing the boom!

That's the breakdown of the eight business indicators which the National Bureau of Economic Research says are the most sensitive to future business trends. They are: Business failures and liabilities (inverted); the Dow-Jones industrial common stock price index; new orders for the durable goods industries; residential building contracts (floor area); commercial and industrial building contracts (floor area); average hours worked per week in manufacturing industries; new incorporations; and the wholesale price index.

Uptrends—All but the construction indicators and new incorporations are pointing to an uptrend. Business failures, which were heavy during most of 1956, began to show signs of easing toward year end. Both the number and total liability dropped to near the lowest point of the year in November. Weekly figures put out by Dun & Bradstreet Inc. indicate that December was at least as favorable as the previous month.

On the other hand, business incorporations, which were strong through the early months of last year, began to decline about mid-year. While the first 11 months of 1956 were still ahead of the similar period of 1955, the trend was unmistakably downward. January, which is usually a good month for new businesses, will reveal whether this is truly a trend or a momentary pause in a long-term growth.

Bulls vs. Bears.—The stock market has been in a slow recovery since the election-inspired low of November. The Dow-Jones list of 30 industrials had two lows and two highs during 1956, motivated to some extent by political events. From November's $479.34 average, the market had moved to about $400 last week.

The biggest weakness in the indicators right now is construction, even though the industry as a whole established a new mark last year. Residential construction, by

BAROMETERS OF BUSINESS

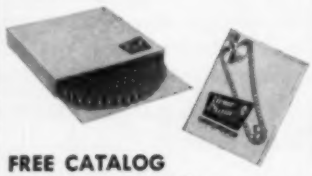
	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,517[1]	2,519	2,437
Electric Power Distributed (million kw-hr)	12,000[1]	11,671	11,594
Bituminous Coal Output (1000 tons)	7,455[1]	10,600	9,270
Petroleum Production (daily avg—1000 bbl)	7,400[1]	7,417	7,014
Construction Volume (*ENR*—millions)	$376.1	$323.7	$461.8
Auto, Truck Output, U. S., Canada (*Ward's*)	177,343[1]	108,781	181,777
TRADE			
Freight Car Loadings (1000 cars)	680[1]	562	710
Business Failures (Dun & Bradstreet)	222	174	198
Currency in Circulation (millions)[3]	$31,479	$31,829	$30,914
Dept. Store Sales (changes from year ago)[3]	0%	+27%	−11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,223	$23,581	$21,702
Federal Gross Debt (billions)	$276.1	$276.6	$280.3
Bond Volume, NYSE (millions)	$22.5	$12.2	$19.6
Stocks Sales, NYSE (thousands of shares)	11,859	10,614	12,101
Loans and Investments (billions)[4]	$87.6	$87.9	$86.5
U. S. Govt. Obligations Held (billions)[4]	$26.8	$26.7	$30.0
PRICES			
STEEL's Finished Steel Price Index[5]	225.92	225.92	209.10
STEEL's Nonferrous Metal Price Index[6]	251.7	251.0	271.0
All Commodities[7]	116.4	116.3	111.7
Commodities Other Than Farm & Foods[7]	124.7	124.6	119.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

off the shelf
service of
ACME
Precision Chains
saves you time
and money!

YOUR ACME DISTRIBUTOR
HAS THE CHAIN YOU NEED
RIGHT IN STOCK

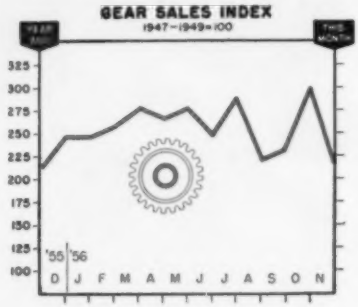
This service makes immediately available to you single strand roller chain in 10 and 25 foot lengths. Chain is neatly packaged, plainly marked, in dirt and damage proof cartons. All standard size chains are stocked by your distributor. Reels available for large quantity handling.



FREE CATALOG
Write Dept. 10-J for your free 80-page catalog packed with valuable chain data.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

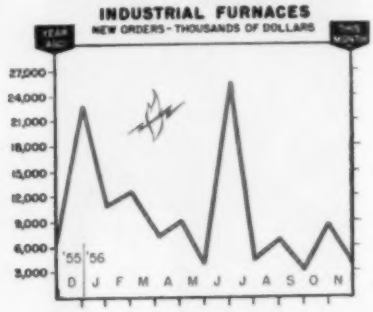
THE BUSINESS TREND



	1956	1955	1954
Jan.	245.5	140.9	167.4
Feb.	256.2	148.5	165.1
Mar.	276.5	172.8	128.6
Apr.	264.7	179.8	158.2
May	275.6	205.2	132.5
June	245.4	193.3	127.4
July	286.7	201.7	141.3
Aug.	219.5	217.6	154.7
Sept.	230.5	246.5	135.1
Oct.	299.8	227.6	152.3
Nov.	216.2	210.4	116.7
Dec.	....	245.5	182.2

American Gear Mfrs. Assn.

Charts copyright, 1957, STEEL.



	1956	1955	1954
Jan.	10,244	4,973	3,643
Feb.	12,163	5,616	3,086
Mar.	7,025	7,345	4,079
Apr.	8,803	7,639	3,496
May	3,620	6,205	5,848
June	25,597*	10,616*	5,663
July	4,140	4,338	1,664
Aug.	6,722	6,273	2,570
Sept.	3,057	8,351	2,534
Oct.	8,741	9,575	3,837
Nov.	3,986	6,180	3,188
Dec.	....	22,548*	6,847

*June, 1955, and 1956 and December, 1955, figures include steel mill furnace orders.
Industrial Heating Equipment Assn. Inc.

any yardstick, is still in a decline. Chances of its getting better in 1957 are slim. A group of 40 home builders, in Washington to discuss credit problems with government officials, predicts that housing starts will drop from 1956's 1.1 million to 900,000 this year.

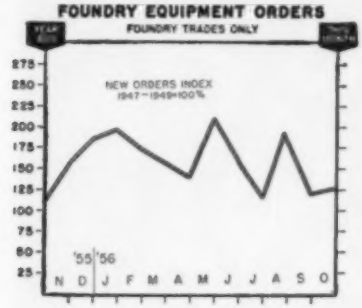
Question Mark—Industrial and commercial construction is in a seasonal decline. But more than that, it has dropped below comparative 1955 periods in recent months. While dollar volume may pick up again and help establish a new record in 1957, some doubt has been expressed lately about the amount of floor space to be built. For construction as a whole, Thomas S. Holden, vice chairman of F. W. Dodge Corp., says: "The prospects for 1957 . . . seem to be for another moderate increase to new record levels, sparked largely by public works construction, with particular emphasis on highways."

The three remaining indicators are the most strongly upward. Net new orders for durable goods, at $15.3 billion, reached the 1956 high in December, seasonally adjusted, and nearly broke the record established in the previous December. The average workweek in manufacturing industries has lengthened steadily since strike-bound July with the exception of November. In December it was 41 hours, the longest average workweek since December, 1955. The Bureau of Labor Statistics reports that wholesale prices are still upward bound, reaching 116.2 per cent of the 1947-1949 base period in December. That's up 4.4 per cent for the year.

The indicators, says the National Bureau of Economic Research, precede peaks and valleys in the general economy of the country by about two to ten months. Taken as a group they have proved fairly accurate in the past. The conclusion that can be drawn from the current situation is that business is on firm footing and should continue that way in the foreseeable future, limited only by the nation's ability to produce and consume goods.

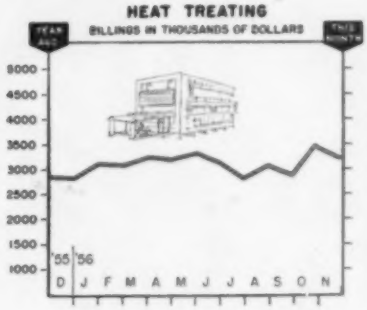
Employment Sets Record

Employment in general had a good month in December. Total nonfarm employment reached a new high of 53,048,000, due largely to the increase in seasonal helpers during the Christmas rush. While manufacturing companies as a whole reduced payrolls by about



	1956	1955	1954
Jan.	195.6	81.0	173.8
Feb.	169.0	90.4	99.9
Mar.	152.7	163.6	82.7
Apr.	135.2	178.6	125.3
May	207.0	145.7	80.8
June	156.7	186.8	86.4
July	110.3	213.4	68.8
Aug.	188.3	134.0	75.6
Sept.	114.7	156.7	68.3
Oct.	122.2	108.6	147.5
Nov.	....	154.4	61.4
Dec.	....	183.9	113.9

Foundry Equipment Mfrs. Assn.



	1956	1955	Per Cent Gain or Loss
January	3,982.8	2,181.0	+41.4
February	3,045.2	2,184.5	+39.4
March	3,226.2	2,599.5	+24.1
April	3,172.0	2,579.5	+23.0
May	3,292.3	2,644.4	+24.5
June	3,094.5	2,645.1	+17.0
July	2,762.5	2,180.0	+26.7
August	3,040.7	2,439.3	+19.9
September	2,832.9	2,581.0	+ 6.2
October	3,442.3	2,897.2	+18.8
November	3,205.7	2,935.7	+ 9.2
December	.....	2,786.6	.....
Total	.....	29,601.2	.....

*Compared with year-ago month.
Metal Treating Institute.

39,000 persons, the five metalworking groups (primary metals, fabricated metal products, electrical and nonelectrical machinery and transportation equipment) boosted their rolls by over 41,000. The biggest increase came in transportation, as the auto industry got rolling in high gear for the first time in several months. Average weekly earnings in manufacturing industries increased from $82.42 in November to $84.05 in December.

In November, the steel industry had one of those rare months when total employment rose while total payroll declined. The American Iron & Steel Institute reports that the payroll of $346,041,000 was second only to the record of nearly $359 million during October. Employment increased to 688,900, a record, but the workweek declined from 40.6 hours in October to 39.8 hours in November. There were also fewer producing days in the latter month, which explains the payroll decline.

Index Back to Normal

STEEL's industrial production index resumed its top-level stature during the week ended Jan. 12, the first full production week of the new year. It hit a preliminary 162 (1947-1949 = 100) on the strength of improved auto production, greater use of electric power and near capacity steel operations. This was 10 percentage points better than the holiday-reduced week ended Jan. 5 and 1 percentage point above the year-ago reading. During the next few weeks, industrial production should hold steady at this high level. Auto companies indicate they will hold production close to the current level to keep dealers' inventories in good shape for the spring push. Sales of 1957 models are described as neither excitingly good nor disturbingly bad. If they should take a turn for the better, there is plenty of capacity in motordom to allow a quick adjustment to the situation.

The steel industry, operating at about 98.5 per cent of its new capacity, will continue to be the most stable element in the production index. Production of electricity will fall short of the peak levels attained before Christmas, but it will still be a potent force in the picture until the spring decline. Freight carloadings, which follow the most severe seasonal pattern of the four components of the index, will be down until spring.

It's Not The TOOT That Runs The Train

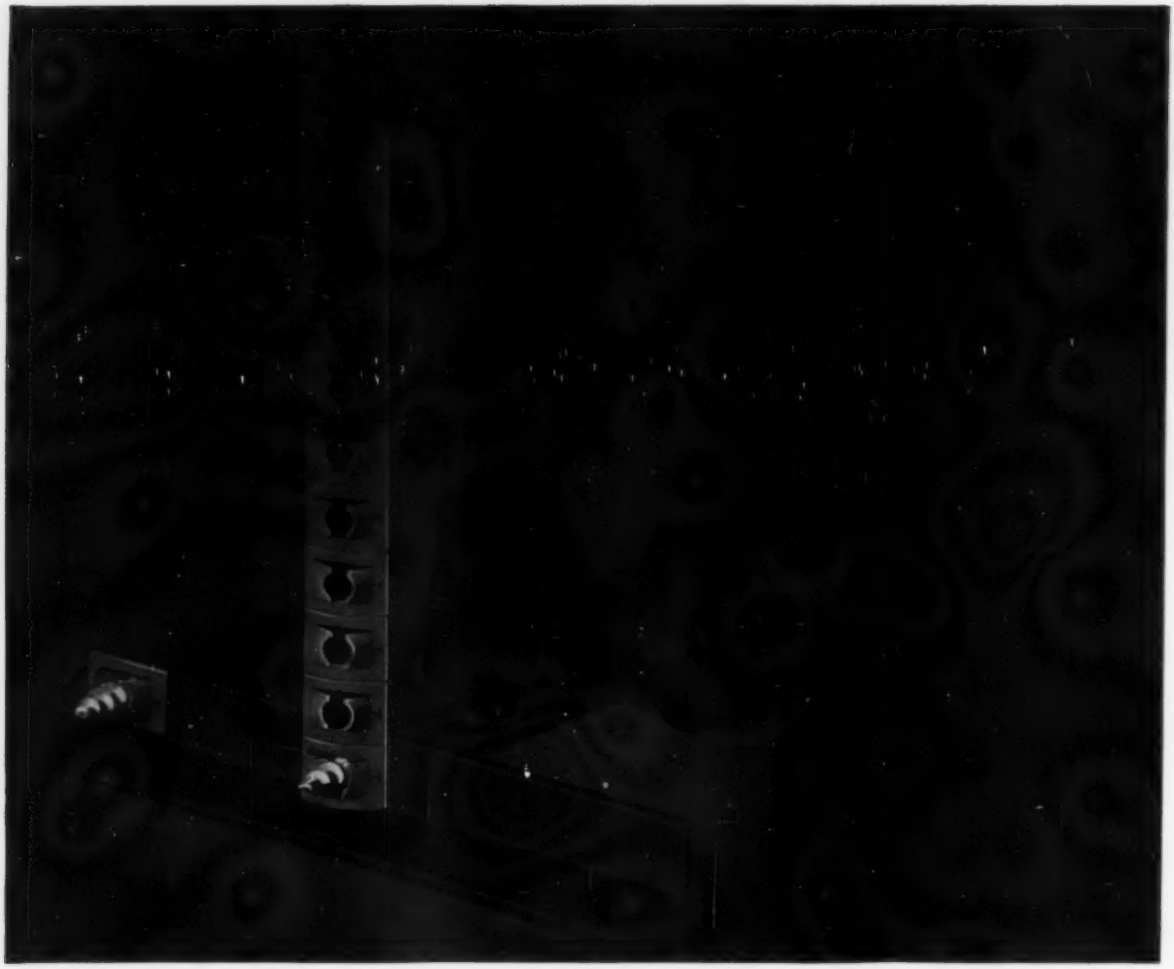
Frank Sorenson, Jr.

TREASURER, THE CINCINNATI GEAR CO.

Did you ever get a tune lodged in the back of your head, and not be able to get it out? I happened to hear a catchy children's record awhile ago that keeps popping up in my mind; I'm a little fuzzy on the exact details but the gist of the lyrics is that "it's not the toot that runs the train, but the chug chug chug." Even though the song was obviously written to appeal to young children, the simple logic of its message is just as important to us grown-ups. Because it is all too easy to lose track of basic objectives in the normal rush of competitive business and the manufacture of a competitive product. To cut a nickel here or there off the "toot" to meet competition is one thing; but if a dime or two also gets cut off the "chug chug chug" for the same reason, it may *show up* for the first time when the product is in the consumer's hands — with lasting adverse effects. Any such quality lapse in the important O.E. products into which many of our custom gears go would be a serious matter for the manufacturer. Our clients know this, and they know that a gear can be a crucial part in their product — and that's why they come to us. They have found from experience that we make their custom gear costs *inexpensive* by giving them the *quality* and *service* they require. We'll do the same for your firm, if given the opportunity.

THE CINCINNATI GEAR CO.
CINCINNATI 27, OHIO
Fifty Years of "Gears—Good Gears Only"

CINTI ®



SPEED NUTS® WITH A HANDLE

eliminate fastener fumbling!

Multiple-unit strips of Tinnerman Flat-Type SPEED NUTS permit cost-cutting, split-second fastening. That's how Reznor Mfg. Co., Mercer, Pa., saves up to 40% in the assembly of louvers for its Suspended Gas Unit Heaters!

With strip in hand, the operator drives a screw into the end SPEED NUT, easily snaps off the tightened fastener from the strip and quickly places the next SPEED NUT in screw-receiving position. No lost motion feeling or fumbling for single fasteners, spanner or lock washers. Louvers are securely fastened, and are easily adjusted to control air distribution.

This is an example of the versatility of SPEED NUTS. It is also an example of the assembly advantages of SPEED NUT brand fasteners. Over 8000 types give you an answer to almost every fastening problem. See your Tinnerman representative or write for complete details.

TINNERMAN PRODUCTS, INC.
BOX 6688 • DEPT. 12 • CLEVELAND 1, OHIO

TINNERMAN

Speed Nuts®

FASTEST THING IN FASTENINGS®

Canada: Dominion Fasteners, Limited, Hamilton, Ontario. Great Britain: Simmonds Aerocessories, Limited, Treforest, Wales. France: Simmonds, S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). Germany: Hans Sickinger GmbH "RICARD", Lizenz - / - Lizenz.

S. T. MACKENZIE
. . . Babcock & Wilcox v. p.-boiler div.

ERNEST F. DONATIC
. . . gen. supt., Kaiser Fontana plant

VICTOR F. STINE
. . . Pangborn president

S. T. Mackenzie was elected a vice president of **Babcock & Wilcox Co.** and placed in charge of the sales department of the boiler division, New York. Formerly sales manager of the department, he succeeds **W. T. McCullough Jr.**, retired. **Robert K. Allen** was made superintendent of product development at the Alliance, O., Research Center to succeed the late **G. A. Watts. Paul M. Brister** was made manager, engineering design section, manufacturing engineering department, Barberton, O., Works.

Robert E. Munson was made general sales manager, **Central Screw Co.**, Chicago. He was district sales manager, New England division, located at Keene, N. H.

Lyman A. Bliss was made president of **Union Carbide Nuclear Co.**, division of Union Carbide & Carbon Corp., New York. He succeeds **Kenneth Rush**, Union Carbide vice president, who continues over-all responsibility for the corporation's nuclear and international activities.

F. L. Griffith and **F. W. Blanchard** were elected vice presidents, **Hewitt - Robins Inc.**, Stamford, Conn. Formerly factory manager, Mr. Blanchard is responsible for manufacturing and engineering, industrial products divisions. Mr. Griffith continues as general sales manager of the divisions.

Ernest F. Donatic was named general superintendent of **Kaiser Steel Corp.'s** Fontana, Calif., plant. He was assistant general superintendent of services. **James P. Williams** was made manager of engineering and planning.

Henry M. Haase, vice president of engineering and research, **Borg-Warner Corp.**, was elected president and chief executive officer, York Division, York, Pa. **Stewart E. Lauer**, York president for 16 years, becomes chairman. He succeeds **Roy C. Ingersoll**, Borg-Warner chairman, who assumed the division chairmanship when York Corp. merged with Borg-Warner in July.

Willis D. Horner was elected vice president-sales, **Allen Mfg. Co.**, Hartford, Conn. He was sales manager.

Dr. A. W. Coffman was elected president, **H. H. Robertson Co.**, Pittsburgh, succeeding **Dr. J. H. Young**, retired. Dr. Coffman was executive vice president.

Robert J. Benwell was made manager of **C. H. Wheeler Mfg. Co.'s** Wheelerweld Division, Ambler, Pa., formerly known as Cruse-Kemper Division.

Ben Milt was made sales manager, **Jensen Specialties Inc.**, Detroit. He succeeds **Burtron Zook**, resigned.

Victor F. Stine was elected president, **Pangborn Corp.**, Hagerstown, Md. He was vice president-sales and engineering. **Ralph M. Trent** was elected executive vice president; **W. O. Vedder**, a vice president. **Thomas W. Pangborn**, founder and president since 1904, is now chairman. **John C. Pangborn**, first vice president, was made vice chairman of the board.

H. D. Bryk was made manager of operations, **Alloy Precision Castings Co.**, Cleveland. He joined the firm in July as an assistant to executive vice president - general manager.

Stanley Adamek was made manager of manufacturing, **Pheoll Mfg. Co.**, Chicago. He was works manager. **Jack H. Lewis** was made manager-technical sales.

Deringer Metallurgical Corp., Skokie, Ill., elected **Edwin F. Allison** president to succeed the founder, the late **J. Paul Deringer**. Mr. Allison has been executive vice president and general manager for the last two years and prior to that was eastern sales manager. **Evelyn H. Deringer** was elected vice president-secretary.

A. Kenneth Hannum was made chief engineer, replacement division, **Thompson Products Inc.**, Cleveland. He replaces **Ray J. Stanish**, named manager of the new

ROBERT C. DOWNIE
. . . executive post at Superior Steel

HUGH V. ALLISON
. . . adds post at American Chain & Cable

DAVID H. NICHOLSON
. . . Morgan Eng. vice president-mfg.

central staff placement department.

Robert C. Downie joined **Superior Steel Corp.**, Carnegie, Pa., as assistant to the president and assistant general manager. He was a partner in Arthurs, Lestrange & Co., Pittsburgh investment banking firm.

Arthur B. Tillman fills the new post of operations manager, Electro Chemicals Division, **Diamond Alkali Co.**, Cleveland. He was assistant works-manager, Painesville, O., plant.

Claud A. Fenn, vice president, **Clark Equipment Co.**, Buchanan, Mich., fills a new post on the president's staff to co-ordinate manufacturing operations in all company plants.

John W. Little was elected president, **Goslin-Birmingham Mfg. Co.**, Birmingham, to succeed **Joseph T. Hartson**, retired. Mr. Little was executive vice president.

Edwin A. Cunningham Jr. was named manager of **Hagan Chemicals & Controls Inc.'s** new Pittsburgh production engineering department. He is replaced as contract department manager by **C. R. Shriner.**

Thomas M. Rees, former president of Rees Machinery Co. Inc., is now affiliated with **Stanley Berg Machinery Co.** in the sale of heavy machinery in the Pittsburgh and tri-state area.

Hugh V. Allison, president and general manager, Allison Division, **American Chain & Cable Co. Inc.**, Bridgeport, Conn., was also appointed to fill the new post of general manager of the Campbell Machine Division, Bridgeport.

James L. Lecka was made sales manager of **Instrument Development & Mfg. Corp.**, Pasadena, Calif.

Poole Foundry & Machine Co., Baltimore, elected **S. P. Brady Jr.** chairman; **L. M. Ricketts** president-treasurer; **L. M. Ricketts Jr.**, executive vice president-assistant treasurer; **R. D. Ricketts**, secretary; **A. E. Swanson**, vice president-engineering.

Cold Metal Products Co., Youngstown, appointed **J. T. Bachman** vice president-general sales manager; **E. V. Mort**, plant manager at Youngstown; **E. B. Whittemore**, assistant general sales manager; **J. R. Colwes**, manager, production planning and scheduling; **E. J. Moorhead**, manager, order department.

Warren F. Bice, sales manager, was promoted to general manager, **Progressive Mfg. Co.**, division of Torrington Co., Torrington, Conn. He succeeds **Ralph H. Perry**, retired.

Charles G. Cooper was made vice president, **Cooper-Bessemer Corp.**, Mt. Vernon, O., and its export subsidiaries. He has offices in New York.

David H. Nicholson was elected vice president - manufacturing at **Morgan Engineering Co.**, Alliance, O. He was vice president-industrial relations.

Frank E. Farris was made manager, Process Control Systems, a new organization devoted to automation and allied problems at **North American Philips Co. Inc.**, instruments division, Mt. Vernon, N. Y.

P. M. Wheeler was made sales manager, **Indiana Steel Products Co.**, Valparaiso, Ind. He was assistant sales manager.

Howard N. Hubbard was made assistant general superintendent, Lorain, O., Works, **National Tube Division**, U.S. Steel Corp. He succeeds **L. F. Sattele**, now general superintendent of the division's National Works, McKeesport, Pa.

August L. Bartz was made Ft. Worth, Tex., district sales manager for U.S. Steel Corp.'s **American Steel & Wire Division**, Cyclone Fence Department. **William M. Welsh** was made assistant manager of AS&W's Detroit sales office.

S. W. Wheeler was made assistant chief engineer of **Republic Steel Corp.'s** Warren, O., district. He succeeds **I. H. Lundgren**, recently made chief engineer.

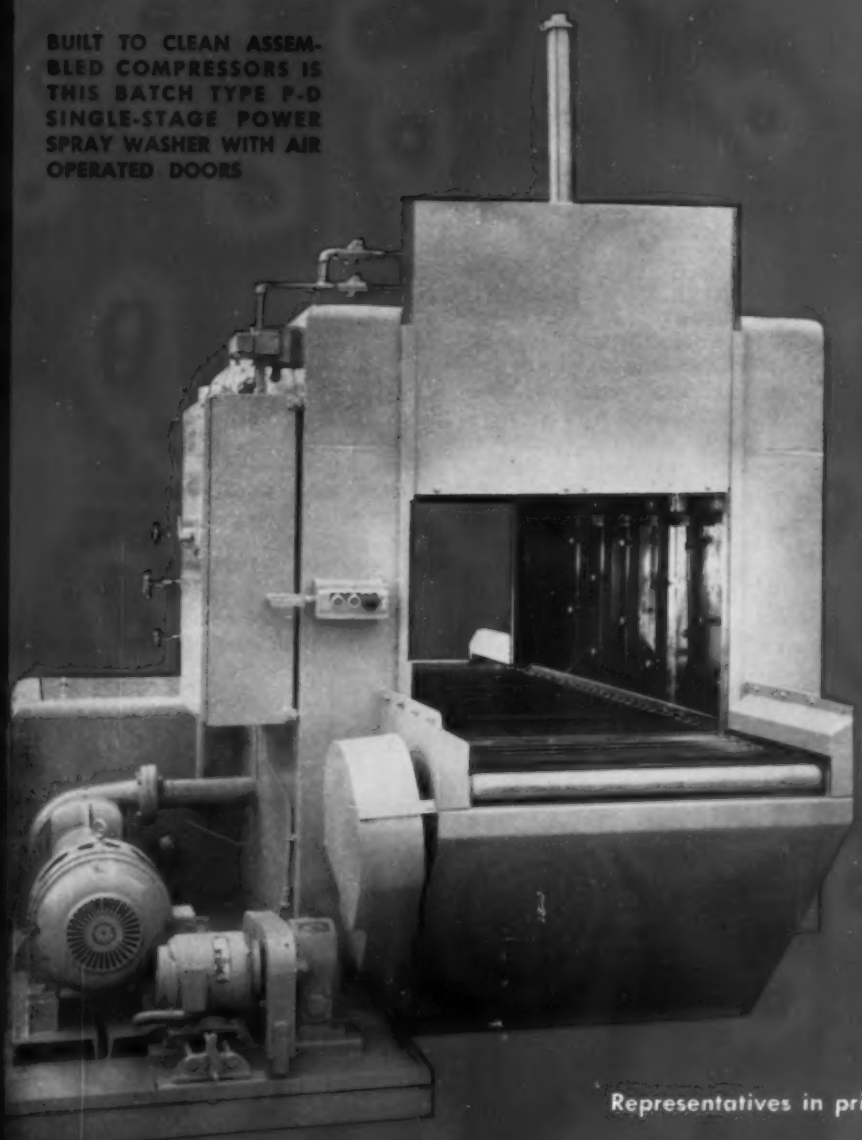
Oliver W. Nelson and **Arne C. Johnson** were elected vice presidents of **Botwinik Bros. of Mass.**

KEY to LASTING FINISHES

—Surface Preparation with

PETERS-DALTON POWER SPRAY WASHERS

BUILT TO CLEAN ASSEMBLED COMPRESSORS IS THIS BATCH TYPE P-D SINGLE-STAGE POWER SPRAY WASHER WITH AIR OPERATED DOORS



The final finish and appearance of a manufactured product is certainly important to its saleability. When cleaning operations are required, following machining, it is essential for them to be done so that finishes can be applied to parts that have smooth, clean, surfaces—freed of grit and grease.

For more than a quarter century Peters-Dalton has been designing, engineering, building and installing power spray washers, of all sizes and types, for use in American industry. Our engineering department is ready and able to assist you, whether your requirements are for a single-stage unit or for a multiple-stage system. Depend with confidence on P-D. If you can, send us your specifications or layout for the type job required. Just write, wire or phone — we'll be glad to tell you more.

Representatives in principal cities.

- Hydro-Whirl Paint Spray Booths
- Industrial Washing Equipment
- Drying and Baking Ovens
- Hydro-Whirl Dust Collecting Systems

1-57

PD Peters-Dalton INC.
A SUBSIDIARY OF DETROIT HARVESTER CO.
17892 Ryan Road • Detroit 12, Michigan

LESTER C. SMITH

R. A. BRACKETT

. . . *Spencer Turbine executive appointments*

Inc. and **Sherman Rubber Machinery Co.**, both of Worcester, Mass.

Lester C. Smith was elected president and **R. A. Brackett**, executive vice president, **Spencer Turbine Co.**, Hartford, Conn. Appointments follow retirement of **H. H. Richardson**, president since 1930.

Alonzo A. Neese was named chairman of **Warner Electric Brake & Clutch Co.**, Beloit, Wis., to succeed the late **Pierpont J. E. Wood**. Mr. Neese is vice president of Beloit Iron Works and of Beloit International Corp.

Owen R. Rice and **Fred W. Rys** were given new assignments in the engineering and construction division, **Koppers Co. Inc.** Mr. Rice, divisional vice president and former manager, Freyn Engineering Department, was named a special consultant to **Dr. W. C. Rueckel**, division vice president-general manager. Mr. Rys succeeds Mr. Rice as vice president-manager, Freyn Department.

J. H. Fleming was made assistant manager, shipping container sales division, **Wheeling Steel Corp.**, Wheeling, W. Va.

Richard M. Hartigan was made manager of manufacturing for **General Electric Co.'s** large motor and generator department, Schenectady, N. Y. He succeeds **P. F. Lathrop**, named a consultant. Mr. Hartigan was manager of manufacturing, direct current motor and generator department, Erie, Pa.

Lloyd L. Pernot, transport sales manager, was promoted to director of sales engineering at **Four Wheel Drive Auto Co.**, Clintonville, Wis. **Victor M. Anderson** was made assistant to vice president-sales; **Fred A. Brown** and **Robert J. Peterson**, assistant sales managers.

Crucible Steel Co. of America appointed **Reinhold Schempp** manager of its Sanderson-Halcomb Works, Syracuse, N. Y., to succeed **R. A. Schneid**, retired; **S. A. Fronek**, manager of its Park Works, Pittsburgh, to succeed **S. A. Jackson**, retired. **Eugene A. March** succeeds Mr. Schempp as assistant manager and is replaced by **Robert K. Dunn** as chief metallurgist at Sanderson - Halcomb. **Robert F. Spillett** fills the new post of New England tool steel supervisor for the company at Cambridge, Mass.

George F. Hodgson was made assistant chief engineer, **Doehler-Jarvis Division**, National Lead Co., Toledo, O. Effective Feb. 1, he will transfer from Batavia, N. Y., where he is plant engineer for the division's operation.

Lithium Corp. of America Inc., Minneapolis, named as vice presidents: **Dr. R. B. Ellestad**, director of research; **Walter M. Fenton**, director of product research and development; **J. Dean Herman**, director of chemical plant operations; **J. D. Campbell**, director of sales. **Willis W. Osborne**, treasurer, and **Fremont F. Clarke**, general manager-operations (both vice presidents) were elected senior vice presidents.

Regal C. Meier was elected a vice president, **New Process Gear Corp.**, Syracuse, N. Y.

Glenn B. Warren, **General Electric Co.** vice president, was appointed consulting engineer-turbine division, Schenectady, N. Y. His former duties as general manager of the division are assumed by **William S. Ginn**, vice president. **Raymond W. Smith** succeeds Mr. Ginn

REINHOLD SCHEMPP

S. A. FRONEK

. . . *Crucible Steel works managers*

....for better FORGING PRODUCTION!

Sharon Open Hearth Quality Forging Ingots — now available in Carbon and Alloy grades, with ingot weights up to 109,000 pounds. Sharon Electric Furnace Quality Ingots — Stainless and Alloy grades, up to 50,000 pounds. • Sharon is also a prime supplier of billets, blooms and slabs — to customer specifications — in Stainless and Alloy grades. For prices — contact the Sharon Steel Corporation, Forging and Semi-Finished Steel Sales Department — or one of the district sales offices listed below.

SHARONSTEEL

SHARON STEEL CORPORATION *Sharon, Pennsylvania*

DISTRICT SALES OFFICES: Chicago, Cincinnati, Cleveland, Dayton, Detroit, Grand Rapids, Indianapolis, Los Angeles, Milwaukee, New York, Philadelphia, Rochester, San Francisco, Sharon, Seattle, Montreal, Que., Toronto, Ont.

JOHN MOXON
. . . Carpenter Steel executive v. p.

J. E. McWILLIAMS
. . . Blaw-Knox vice president

GORDON C. CURRY
. . . Precision Castings gen. sales mgr.

as general manager, transformer division, Pittsfield, Mass.

John Moxon, vice president, secretary-treasurer, was elected to the new office of executive vice president of **Carpenter Steel Co.,** Reading, Pa. **Willard E. Roberts** was made secretary-treasurer.

Misco Precision Casting Co., Muskegon, Mich., elected **Joseph H. Cadieux** vice president - manufacturing; **Freeman M. Jones,** administrative vice president; **Kenneth J. Yonker,** vice president-sales. Mr. Cadieux, formerly manager of the Detroit plant, will move to Muskegon.

Ajax Flexible Coupling Co. Inc., Westfield, N. Y., elected **Harley E. Northrop** president; **Charles W. Belden,** vice president. **Wayne Belden,** former president, continues as marketing and public relations counsel.

Nicholas C. Gianakos was elected vice president-sales, **Virginia Metal Products Inc.,** Orange, Va. He was acting sales manager.

J. E. McWilliams was elected vice president-purchasing, **Blaw - Knox Co.,** Pittsburgh. He was purchasing director.

William B. Thomas was made manager of **Kaiser Aluminum & Chemical Corp.'s** new extrusion plant at Dolton, Ill., acquired in October from Hokin Aluminum Co. **Clyde R. St. John** was made general staff metallurgist at Oakland, Calif.

Delos Sabin was named buyer of castings and powdered metal parts for **Leece-Neville Co.,** Cleveland. **John Toth** was made buyer of plastic molded parts.

Dr. Clarence A. Stiegman was named director of product development of **Hooker Electrochemical Co.,** Niagara Falls, N. Y. He was vice president and technical director of Oldbury Electro-Chemical Co. prior to its consolidation into Hooker Nov. 29.

P. H. Yorke was made district manager of **Edgewater Steel Co.'s** new St. Louis office.

Gordon C. Curry, eastern sales manager, fills a new post of general sales manager at **Precision Castings Co.,** Fayetteville, N. Y., division of Harsco Corp. A new home sales department office in Fayetteville is managed by **Boyden W. Hindman; J. Paul Evans** an assistant.

Charles W. Burton Jr. was elected president of **Anchor Post Products Inc., Baltimore.** Formerly executive vice president, he succeeds the late **William F. Brannan. J. S. Case** remains vice president-production. **Robert R. Brannan,** formerly assistant sales manager, was elected vice president-sales.

Emil J. Kocour was appointed chief engineer, **Sloan Valve Co.,** Chicago.

Ralph K. Lorton was named plant manager, **Centrifugal Foundry Co.,** Muskegon, Mich., subsidiary of Perfect Circle Corp. He replaces **Clayton W. Anderson,** resigned. Mr. Lorton was production superintendent of the sleeve castings plant in Richmond, Ind.

OBITUARIES . . .

J. Mills Summers, 68, president, **Camloc Fastener Corp.,** Paramus, N. J., died Jan. 4.

Frank K. Smith, a founder of **Tecumseh Products Co.,** Tecumseh, Mich., died Jan. 2. He retired in May but continued as a consultant.

Edgar G. Seybold, 65, retired president, **Hendey Machine Co.,** Torrington, Conn., died Jan. 8.

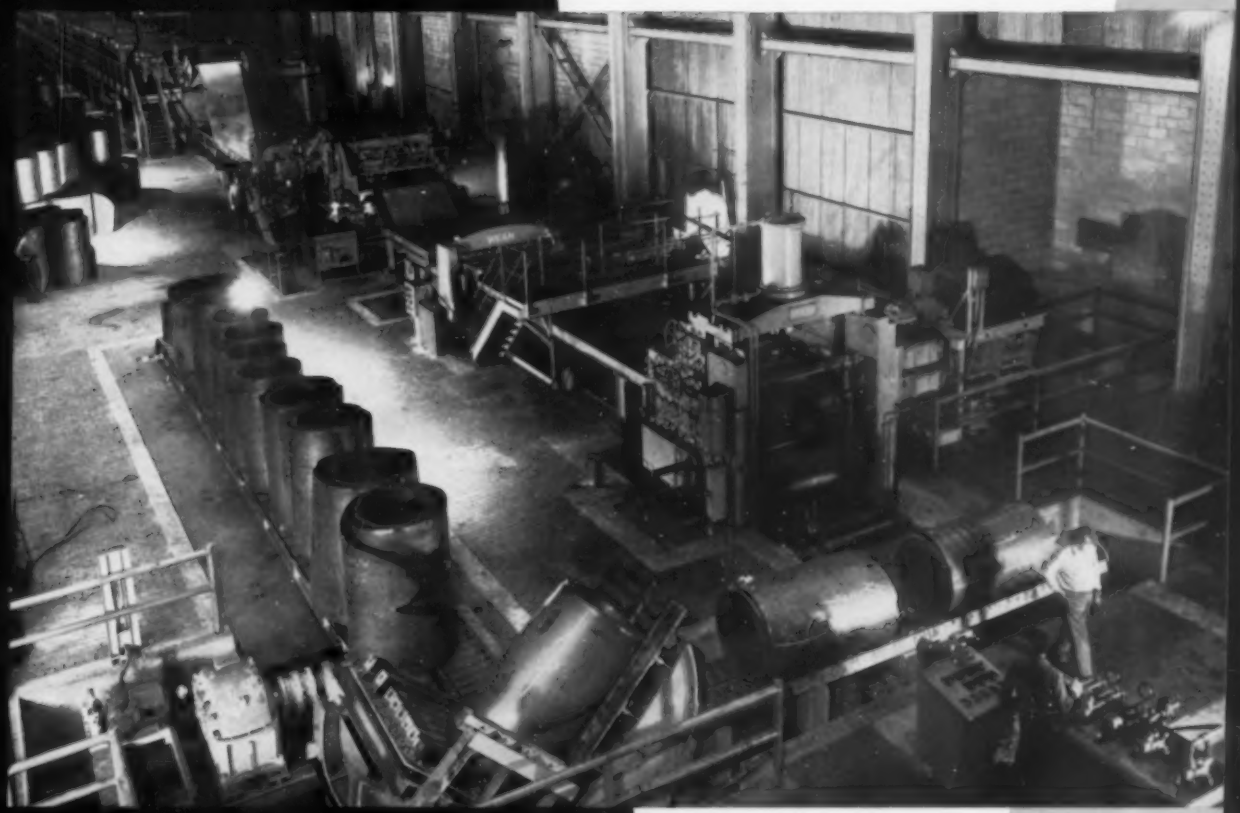
Clarence S. Brock, 65, chief metallurgist, **Moltrup Steel Products Co.,** Beaver Falls, Pa., died Jan. 2.

Frank R. Sargeant, 69, former executive vice president, **Yoder Co.,** Cleveland, died Jan. 13.

Louis S. Clarke, 90, founder, **Autocar Truck Co.,** Exton, Pa., and inventor of auto drive shaft, died Jan. 6 in Florida.

HOW WEAN CREATIVE ENGINEERING

improves continuous Strip Pickling



FASTER, more uniform pickling at reduced costs — that's why leading steel producers prefer Wean Continuous Strip Pickling Lines. From the McKay Processing Uncoiler to recoiling, the Wean line is engineered to deliver highest quality at greatest speed.

WEAN

THE WEAN ENGINEERING COMPANY INC., WARREN, OHIO

see what a Harris Press can show you about scrap metal baling

BALING PRODUCTION COSTS GO DOWN... PROFITS GO UP!

1018 TONS CRUSHING FORCE. This Monster Hydraulic Press will crush anything from gondola car siding, trucks, and autos, down to small scrap. CHARGING BOX — 80" wide x 72" deep x 20' 0" long. Average bale size is 24" wide x 24" high x 60" long.

TG-3000

BETTER HANDLING... BIGGER PROFITS

TALK WITH A MAN FROM HARRIS

HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA

Cuts Rolling Costs

New process for fabricating shapes from copper powder is developed by Chemetals Corp.

E. W. BLISS CO., Canton, O., manufacturer of metalworking equipment, acquired a 20 per cent interest in Chemetals Corp., a research and development organization. Chemetals is principally concerned with the production of copper powder by chemical methods and the fabrication of copper strip, tubing and other wrought shapes directly from the copper powder. Both of these processes are revolutionary to the copper industry.

Chemical—The first process involves the leaching of copper values from scrap, cement, matte, blister or concentrates and the production of high purity copper powder directly from solution in autoclaves by gaseous reduction. The process was piloted by Chemetals for three years and the first semicommercial plant is now in production under license from Chemetals at the Whitaker Metals Corp., Kansas City, Mo. The plant is being operated by Fluor Corp. Ltd. to provide the basis for improved large plant design, construction and operation. The Fluor Corp. also is a large stockholder of Chemetals Corp.

Rolling Process — The copper powder rolling process enables the copper powder to be fabricated directly into copper strip, tubing and other copper or copper-alloy end products without melting the powder into "cake" or ingot. The ability to fabricate directly from powder avoids a lengthy series of rolling operations and anneals with a saving in capital equipment and operating costs of the magnitude of 70 to 80 per cent of the costs of conventional methods. Chemetals holds exclusive rights to this process for nonferrous metal powders from Mannesman AKT, Dusseldorf, Germany, and Sundwiger Messingwerk, Sundwig, Germany.

Robert Potter, Bliss president, says his company has operated a pilot plant of its own at Salem, O., has studied the results of the first commercial operation at Sundwiger Messingwerk, and is now in a position to offer customer fixed-cost plants accompanied by guarantees of heat, power and labor requirements.

Kaiser Buys Wire-Cable Line

Kaiser Aluminum & Chemical Corp., Oakland, Calif., purchased the wire and cable business of United States Rubber Co., New York. The acquisition, effective Feb. 1, includes an insulated wire and cable plant at Bristol, R. I., and U.S. Rubber's wire and cable inventories.

Chicago Bridge Opens Branch

Chicago Bridge & Iron Co., Chicago, opened a sales office at 2400 Canal St., New Orleans, under the managership of J. U. Blanchard. Chicago Bridge also announced the retirement of W. S. Nesbitt as manager of its Greenville, Pa., plant and the appointment of his successor, L. J. Harris.

ASSOCIATIONS

W. Paul Eddy, Pratt & Whitney Aircraft Division, United Aircraft Corp., was elected president of the **Society of Automotive Engineers Inc.**, New York.

B. J. Hank, Conlon-Moore Corp., Cicero, Ill., was re-elected president of **American Home Laundry Manufacturers' Association**, Chicago. Other officers are: Ray G. Halvorsen, Hamilton Mfg. Co., Two Rivers, Wis., first vice president; H. B. Miller, Home Laundry Department, General Electric Co., Schenectady, N. Y., second vice president; H. L. Travis, Kelvinator Division, American Motors Corp., Detroit, third vice president; G. M. Sheehan, GE's Home Laundry Department, treasurer; W. Homer Reeve, Easy Washing Machine Division, Murray Corp. of America, Syracuse, N. Y., past president.

Dr. B. D. Thomas has been appointed director of **Battelle Memorial Institute**, Columbus, O. He succeeds Dr. Clyde Williams, president, in the management of Battelle's research operations.

NEW ADDRESSES

Prefabricated Home Manufacturers' Institute moved to enlarged quarters in the Barr Bldg., 910-17th St. N.W., Washington, D. C. Conrad "Pat" Harness is executive vice president.

Conveyor Systems Inc., Chicago, opened offices at 2832 E. Grand Blvd., Detroit 11, Mich. The firm makes material handling systems and special material handling machinery.

CONSOLIDATIONS

Freeway Washer & Stamping Co., Cleveland, purchased **Omega Ball Bearing Co.**, Poughkeepsie, N. Y. The acquisition will greatly enlarge the Freeway line of semiprecision bearings, says H. K. Honroth, president. All of Omega's manufacturing and maintenance equipment, tools and dies are being moved to Cleveland for installation at Freeway. Plans are being made for expanding Freeway's plant.

Trackson Co., previously operated as a wholly owned subsidiary of **Caterpillar Tractor Co.**, has become the Milwaukee plant of Caterpillar Tractor.

H. K. Porter Company Inc., New York, purchased **Mullite Refractories Co.**, Shelton, Conn. Porter will combine it with its Laclede-Christy Co. Division.

Webster Mfg. Inc., Tiffin, O., purchased **Eugene Stacy Co.** (load binders), that city. A new corporation, Stacy Load Binder Co., has been formed to operate the business as a wholly owned subsidiary of Webster, manufacturer of elevating and conveying equipment for handling bulk materials.

Ajax Engineering Corp., Trenton, N. J., and **Ajax Electric Furnace Corp.**, Philadelphia, are combining their engineering, manufacturing, and sales efforts. They are in the field of electric line frequency induction melting of metals.

HOW

*. . . **Torrington** can make your small precision metal parts **faster, better** and **for less** than you can make them or buy them elsewhere*

These are typical of parts that Torrington produces daily by the hundreds or millions. If you use similar small precision parts, find out today how much you can save and the quality you can get by letting Torrington make them. Mail the coupon for the Torrington Small Precision Parts Condensed Catalog or to have a representative call. Even better, send a sketch, blueprint or sample part and we will give you a prompt quotation which will mean substantial savings to you.

THE TORRINGTON COMPANY • Specialties Division
900 Field Street, Torrington, Conn.

TORRINGTON
SPECIAL METAL PARTS
Makers of Torrington Needle Bearings

The Torrington Company – Specialties Division
900 Field Street, Torrington, Conn.

☐ Please send the Torrington Small Precision Parts Condensed Catalog.
☐ Please have representative call.
☐ Please send a quotation on enclosed sketch, blueprint, part.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Technical Outlook

REACTOR TUBING—Superior Tube Co., Norristown, Pa. reveals that it's making the first Zircoloy tubing (zirconium alloy with small amounts of iron, chromium, nickel and tin) for an atomic reactor. It will be used for blanket assemblies in the pressurized water reactor being built by Westinghouse for the AEC-Duquesne Light Co.'s Shippingport Atomic Power Station.

THREAD GAGING— Accurate checking of threads requires two kind of gages, says the Standard Pressed Steel Co., Jenkintown, Pa., in a booklet just released. You need one which measures many threads at once to catch oversize threads, since lead and angle errors increase effective pitch diameter. You also need one which measures only a few threads to detect threads at the low limit.

WROUGHT FROM POWDER— Sinterwrought, a process for making wrought products from metal powders, may eliminate many of the disadvantages of conventional sintered and wrought materials. Sinterwrought products have greater strength and ductility than conventional metal powder products, but they do not contain the impurities of cast billets from which wrought materials are made, says Sintercast Corp. of America, Yonkers, N. Y. Any symmetrical shape can be made by the process.

INSULATION OUTLASTS MOTOR— After the equivalent of 5787 operating years, a much-abused motor broke down a few weeks ago. It was the seventh of eight motors to fail. (They were put on test by Westinghouse Electric Corp. and Dow Corning Corp. in October, 1943, to check the life of silicone insulation.) But the insulation never failed. In most cases, breakdown was due to copper oxidation. The seventh motor failed because excess heat warped the rotor until it rubbed the stator, pulling stator laminations until one finally pinched through slot and wire insulation. The eighth motor is still going strong.

BULK BLENDER— You can blend bulk materials simply by feeding them through a gravity operated bin. The secret: A series of overlapping baffles along the tapered sides of the bin. You can get a drawing of the device (just patented) from Hewitt-Robins Inc., Stamford, Conn.

GOLD-PLATED WINDSHIELDS— Scientists at the Ford Motor Co., Detroit, are trying a microscopically thin film of pure gold to keep the sun's heat out of your car. It's a good reflector of infrared, yet permits the shorter (and cooler) wave lengths of light to pass through. Here's how it's done: The windshield and gold foil are put in a vacuum chamber. As the foil is melted, gold molecules are deposited on the glass. A light meter measures the film and halts the process when the right thickness is reached.

SOLDERING SHEET— Zinc-clad aluminum alloy promises to eliminate many of the problems of soldering heat exchanger equipment, particularly auto radiators. Developed by Aluminum Co. of America, the product comes with one or both sides clad, in coils or flat sheets.

MACHINE RELIEVES STRESS— A seven-station transfer machine built by Snyder Tool & Engineering Co., Detroit, automatically relieves machining stresses in a bolted workpiece by loosening and then tightening bolts between operations. Working on differential carrier and cap assemblies, the machine rough bores two bearing holes, loosens and retightens the cap bolts and semifinish bores the two bearing holes.

Metalworking Outlook—p. 29 *Market Outlook—p. 103*

Continuous Contouring

AIRFRAME makers soon will have 20 of these numerically controlled skin mills. With them go three of the Numericord tape preparation systems and 15 new contouring Variaxes. They'll be built by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

An operator (foreground) prepares paper tape. The computer (rear) converts it to electrical signals for magnetic tape

The maker figures that each of the skin mills will produce at a pace equal to five of its sister template-controlled machines, yet a tape-controlled unit costs only about 5 per cent more than a template machine.

System—To prepare a tape for this machine, the programmer first punches a master paper tape on a 16-key electrical control keyboard. Information for the tape (it covers an entire machining program) is prepared by planning department technicians. Data come from drawings of the part, tooling studies and machine feed rates. A Flexowriter electric typewriter prepares a visual checking copy of all data. The paper tape becomes a permanent record of the machine cycle.

Machines That Obey Orders

THIS YEAR more people will pay attention to tape controls than at any time since the player-piano craze. The reason: Tape and card machine tools are nearly ready to sell themselves to every plant in the country.

It's doubtful that the total numerically controlled machine tool business in 1956 was more than a couple million dollars. In 1957, shipments should surpass the $20 million mark. That's a breakthrough in anybody's terms.

Why — Two separate business catalysts will put numerically controlled machines over the hump. First, a huge Air Force contract calls for big contouring machines to be delivered to airframe manufacturers this year. They'll turn out intricate, three-dimensional skin panels automatically, following instructions issued on magnetic tapes.

Second, nearly a dozen machine tool builders, not involved in the Air Force project, will deliver their first tape or card controlled machines this year. Most of these will be less spectacular, less complex and less expensive than the contouring machines. Their target: Nearly every job shop and short-run plant in the country.

Potential—One of these builders echoed the opinion of all when he told STEEL: "Since we are talking about the type production that goes on in hundreds of smaller shops across the country, I feel safe in predicting a terrific potential market."

This confidence is easily explained. Machine tool builders feel that numerical controls offer an answer to the basic need of the small shop—versatility. It's the branch of automation designed particularly for short production runs.

Positioning

Here the programmer punches the 4-in. plastic type. Tape preparation system here will cost about $500

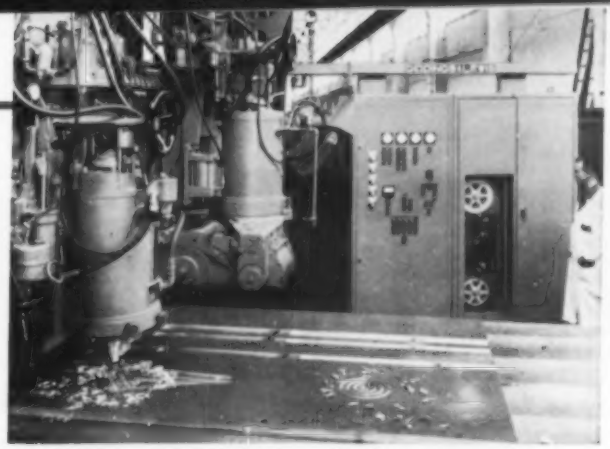
NUMERICALLY controlled positioning will come at the lower end of the cost-complexity curve (it's cheaper and simpler than the contouring machine above). As with this drill table built by Jones & Lamson Machine Co., Springfield, Vt., information supplied by the tape is held to a minimum. The job is to move the table from one point to the next. There's no concern about how it gets there.

This tape, adapted from the turret lathe application, tells the table the X and Y coordinates of the hole, some tape-control functions (like reset) and the operation number.

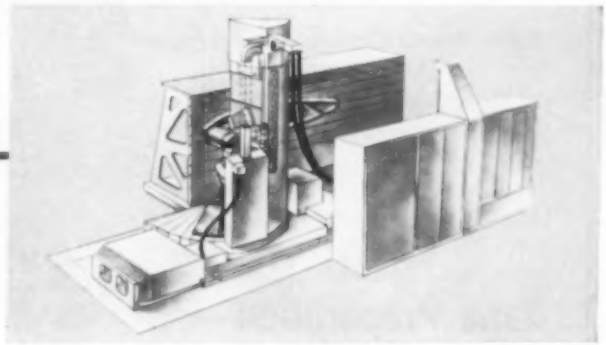
Then an electronic computing director, developed by G&L, converts digital information on the paper tape into time co-ordinated, phase-modulated command signals that are reproduced on parallel channels of a magnetic tape. The magnetic tape is read at the machine. This unit, developed at GE, controls as many as five machine axes and 22 auxiliary machine functions simultaneously.

Prices vary with the design of the machine, and its control requirements. The machine (top, right) probably will cost about $500,000, its tape preparation system $250,000. One tape system will handle programs for four or five machines.

Although the first machines will go to the aircraft industry, G&L management is sure that's not the only market. E. L. McFerren, vice president and general manager of G&L & Hypro Divisions, anticipates demand from diesinking shops, particularly those making dies for big presses.



The tape playback unit (above, background) controls table and both machine heads in feed, traverse, rise and fall. Drawing below shows G&L's new Variax contouring machine



Numerical control adds self-discipline to a machine tool's repertoire. With versatility as its biggest plum, it's aimed squarely at short-lot production costs

Co-ordinated Line — A southern manufacturer does part of his business selling replacement pump rods. He has several hundred types, all essentially stepped shafts. He is installing a line of machines that will cut off, turn, form shoulders and undercuts, mill the splines, grind and thread these rods, each type to its specified dimensions.

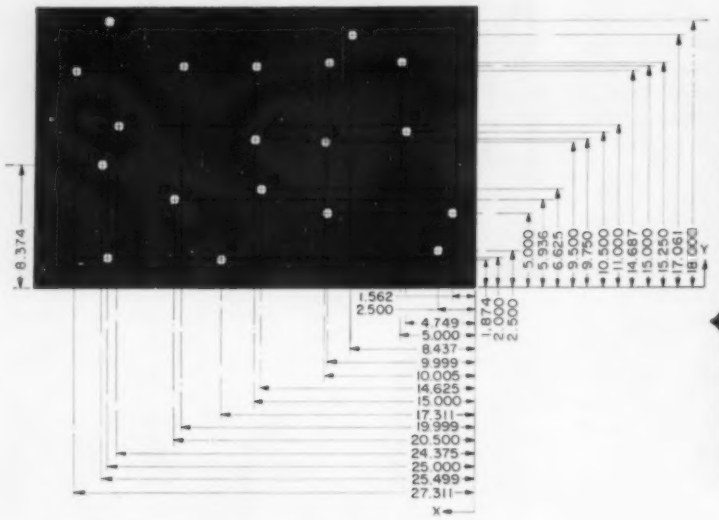
Controls for the entire line will be in a central console that carries a stack of about 350 punched cards. The operator puts blank parts in the first machine and then, with a keyboard, signals the job to be run. The console sorts the right card from the deck, puts it in the reader and starts the cycle for the entire line.

Compound Gains—With this line, the manufacturer will have the optimum in flexibility. He can pick any one job with the push of a button. He can add to, or subtract from, his list of jobs simply

This number signals a column of lights on the control box that tells which operation is being performed. A setup sheet on the box is aligned with these lights so the operator can read what tool is to be used.

Market — This complete machine probably will carry a price of $25,000 to $30,000. That puts the price of the tape control at upwards of $15.000. J&L's production management men have time-studied the numerically controlled machine. They figure it will pay for itself in about three years. They want three more for their own shop.

Positioning will be numerical control's fastest growing offshoot. It's potentially suited to almost every plant in the country.



TAPE INSTRUCTIONS

Hole No.	X Co-ordinate	Y Co-ordinate	Tooling Information
1	2.500	2.500	0.750 Ream
2	5.000	15.250	0.750 Ream
3	9.999	R	0.750 Ream
4	R	5.000	0.750 Ream
5	10.005	9.500	0.750 Ream
6	15.000	9.750	0.750 Ream
7	R	15.000	0.750 Ream
8	19.999	R	0.750 Ream
9	25.000	18.000	0.750 Ream
10	R	2.000	0.750 Ream
11	25.499	8.374	0.750 Ream
12	1.562	5.000	¾ Drill
13	4.749	10.500	¾ Drill
14	8.437	17.061	¾ Drill
15	14.625	6.625	¾ Drill
16	17.311	1.874	¾ Drill
17	20.500	5.936	¾ Drill
18	24.375	11.000	¾ Drill
19	27.311	14.687	¾ Drill

Tape Preparation

TAPE preparation usually is simple. It can be handled by a technician with little or no special training.

On this drilling and reaming job for the Jigmatic positioning table (Arter Grinding Machine Co., Worcester, Mass.) the main programming task is performed by the draftsman who dimensions all holes from X and Y axes (see far left). The intersection of these axes will correspond to the zero position on the table.

The draftsman also puts the dimensions in table form, indicating the hole sequence and tool to be used. The sequence is determined first by holes using the same tool and, second, by holes lying on the same axis, where one motion can be locked to insure maximum accuracy. This he marks with an "R," indicating repeat.

Punch—Next, a technician translates information on the drawing into holes on tape, using the numbered template. The template has two blocks

by adding cards to the deck or taking cards out.

The value of this flexibility compounds itself. Setup time is reduced from hours to minutes. Where he used to wait for an accumulation of orders before setting up, he now can make fewer parts, perhaps only one, and do it economically. He also can make parts as orders dictate, simplifying the inventory problem.

Added Benefits—Although this flexibility is the plus that will sell tape and card controls to most buyers, the machine makers point out other dollar benefits.

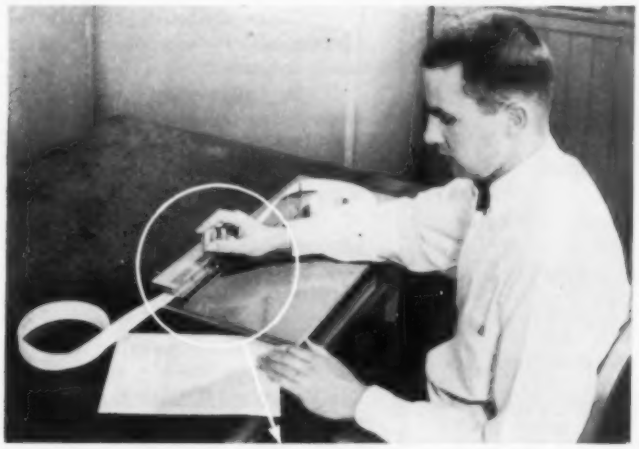
Numerical control feeds mathematics to the machine. There's no operator error, no template or jigs or fixtures to be made to a plus-or-minus tolerance. The only limitation on perfection is the ability of the machine itself. Machine makers are improving this ability by going to such things as ball-nut lead screws to diminish torque and, therefore, windup in the system.

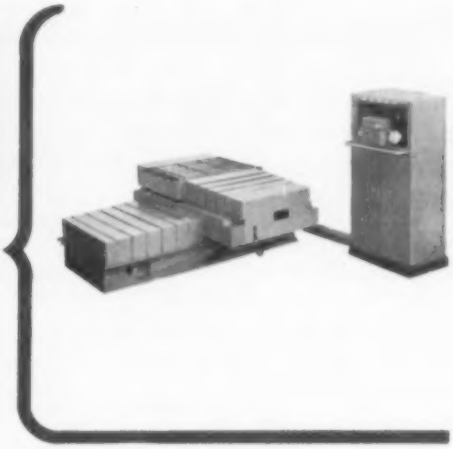
Cycle Time—K. G. Wood, assistant to the manager, facilities engineering, Boeing Airplane Co., Seattle, says: "Numerical control will be of considerable value to the aircraft industry. I say this without qualification for I have seen an aluminum part that once took 23 days to produce, planned, programmed and made in less than half a day. Three and a half hours were needed to make this part with a conventional tracer machine. Using numerical control it was cut in 14 minutes, and far more accurately."

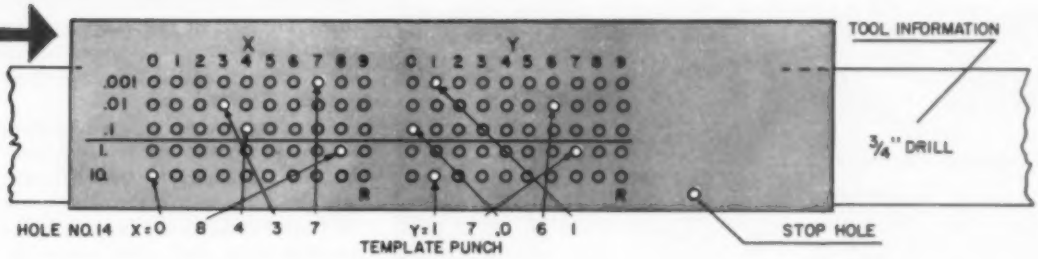
He's talking about contouring, but numerically controlled positioning also can cut cycle times. On a positioning table, for example, table feed in both axes goes on simultaneously. Also the hunt period, when an operator closes in on a precise reading, is cut to a minimum.

Wide Array—By the end of this year, machine tools users will have a wide assortment of numerically controlled machines to choose from. They'll run the gamut in price and complexity. Most, however, will be within wallet-distance of those who can put them to good use.

Among the companies that plan







of 50 holes; one block is for the X axis, one for the Y. Each block has five rows of ten holes. The rows, bottom to top, are for tens, units, tenths, hundredths and thousandths inches.

For hole No. 14 on this part, where X is 8.437, the operator punches 0 in the tens row, 8 in the units row and 4, 3 and 7 in their corresponding rows. The Y information then goes in the other block and a stop hole is punched to control index of the tape through the reader. The 9 hole in the tens row is the repeat hole. It's used when two consecutive holes fall on the same axis, either X or Y. Tool information can be written on the tape for operator reference.

to be selling machines are: Allison Equipment Co., Santa Monica, Calif.; Arter Grinding Machine Co., Worcester, Mass.; Avey Drilling Machine Co., Cincinnati; Barnes Drill Co., Rockford, Ill.; Bendix Aviation Corp., Detroit; Cincinnati Milling Machine Co., Cincinnati; Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.; Gisholt Machine Co., Madison, Wis.; Hillier Instrument Co. Inc., New York; Ingersoll Milling Machine Co., Rockford, Ill.; Jones & Lamson Machine Co., Springfield, Vt.; Monarch Machine Tool Co., Sidney, O.; National Automatic Tool Co. Inc., Richmond, Ind.; Pratt & Whitney Co. Inc., West Hartford, Conn.; Rockford Machine Tool Co., Rockford, Ill.; Sundstrand Machine Tool Co., Rockford, Ill., and Wiedemann Machine Co., Philadelphia. Several others are known to be working on projects—may come out with them in 1957 or 1958.

This list does not include companies that are marketing controls but not machines. These would include: H. L. Barnebey Chemical Processes, Columbus, O.; Barnes Engineering Co., Stamford, Conn.; Concord Controls Inc., Boston; Electronic Control Systems Inc., Los Angeles; General Electric Co., Schenectady, N. Y.; Ferrand Controls Inc., New York, and Topp Industries Inc., Los Angeles.

Still not included are firms like North American Inc., Los Angeles, and International Business Machines Corp., New York, that have developed systems for their own use — may or may not get into the business of selling them.

Two Types—All of the machines will fall into two broad categories, continuous contouring and positioning.

Contouring — Both the Giddings & Lewis and the North American machines use magnetic tape to keep the machines informed. The Cincinnati Milling method will bypass magnetic tape; punched card information fed to a control cabinet will be interpreted and fed directly to the machine. Bendex and IBM use punched paper tape. All of these are milling machines. Prices probably will run from about $50,000 to $500,000.

Positioning — Often called "dis-

Numerical Control's Advantages

These factors are the ones most likely to justify tape or card controls in your plant. They tend to offset initial cost by enhancing the return on investment

Minimum setup time is the best-known advantage. If tapes or cards are already prepared, setup time may be a matter of minutes. Even including programming, this time can be less than that required for a standard machine.

Constant precision is assured since the machine is controlled by mathematics. The precision of machine elements becomes the only limitation.

Shorter economical lots may be possible. With setup time reduced to a minimum, it may be practical to run one part where it used to take a job lot of ten or more. This means easier production scheduling and lower inventory costs.

Fewer jigs and fixtures will be needed. It will save both in making these tools and in storing them.

Faster cycle times may result as machine functions are handled automatically and simultaneously.

Easily altered control data (either tape or cards) allow for design changes. They also are easy to store and don't wear or deteriorate with use.

crete positioning," it is simpler and less expensive since the machine need know only where it is to go next. There's no concern over how it gets there.

Most of the positioning controls are hooked to tables. They'll locate work under, or in front of, machine spindles. The majority have been designed to go with drilling and boring machines, but some makers are looking fondly at other operations like planing, shearing, riveting (STEEL, Nov. 26, 1956, p. 93), and welding. Pratt & Whitney's works with a jig borer (STEEL, July 23, 1956, p. 82). Wiedemann's (STEEL, Aug. 1, 1955, p. 75) is used with a turret punch press.

These machines are controlled by punched paper tape or cards. A few use punched metal tape and one is controlled by magnetic tape. Prices of these systems probably will start at $10,000 to $15,000. Some will control only positioning. Others may also be tied to simple machine functions like spindle start and stop, feed and coolant supply.

Middle Ground — Somewhere between the point-to-point and the contouring systems, lies the need for moving point-to-point under controlled conditions. David N. Smith, manager of development and research, Jones & Lamson, cites his company's numerically controlled turret lathe as an example.

"We bring the tool into position in fast motion, drop it into feed and carry it to a precise end point under controlled rate. Our programming boils down simply to the specification of the end point and the rate at which we desire to go there." J&L's lathe uses a tape. Sundstrand's lathe works from punched cards.

Tape or Cards — At a recent meeting of control engineers, a list was made of the control systems used by the group. The compilation broke down at 15 when someone said: "We are using IBM cards, but we are putting Remington Rand holes in them."

Engineers now prefer punched tape or cards (paper) for positioning, but tape probably has the inside track. It's too early to generalize about contouring controls, but there's a hint that magnetic tape will be used widely for three-dimensional work, punched tape or cards for two dimensions.

Cards and paper tape will be competitive on many jobs. Cards have the advantage of fitting in with business equipment and systems already established. Decks of cards can be reshuffled when production steps change; one card can be added, altered or pulled without affecting the rest of the stack.

Tape reading usually can be simpler since there's no need to shuffle or sort. The tape can be continuous. When the end of the cycle comes, the tape is ready to start over. If the control data are to be handled in the shop, it may prove easier for the operator or setup man to handle one tape than a deck of cards.

Standard—Already, many potential users are calling for standardization. Obviously, if five different machines go into a shop it would be better if all could use the same programming and control system.

It will not be easy to set up standards. One builder thinks the aircraft industry is "whistling in the dark" when it asks that all machines be provided with systems that will permit interchanging tapes from machine to machine and even from plant to plant. Nevertheless, look for a boiling down in system types to three or four basic approaches.

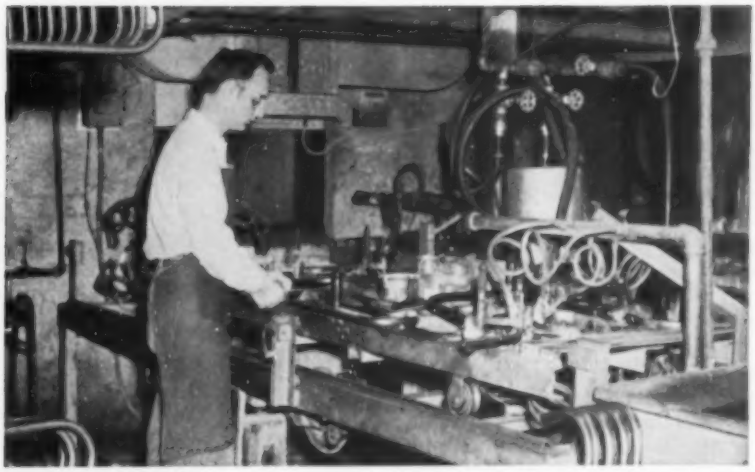
New Breed? — Over the long pull, numerical control may have a bigger influence on basic machine design than any other factor in years. Builders are now speculating on what can, and should, be changed.

Here's how one of them sees it: "When we say automatic, we are implying there is no operator, so let's take off the machine everything that was put on for him to work. Let's redesign the machine around its basic function. . . turn it upside down so the chips fall out instead of falling in. . . let's make it easier to get workpieces in and out. We'll have to start from the floor and do over the entire machine."

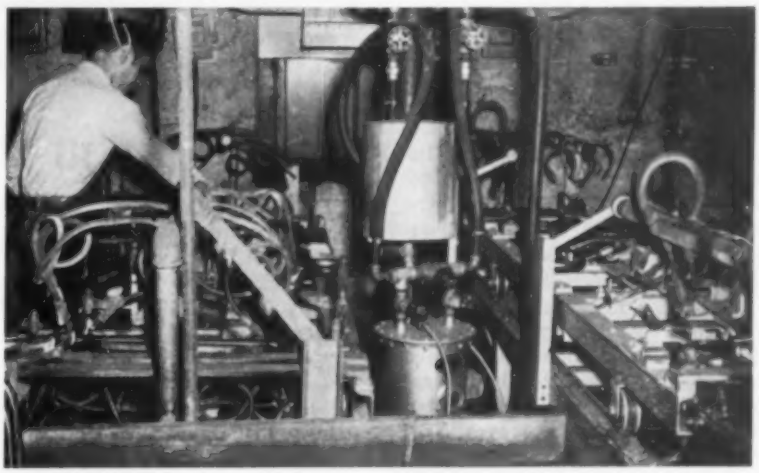
• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

A manufacturer of tubular assemblies reduced his production costs by changing to silver brazing alloy, installing gas-fired brazing machines and using vapor flux

By RALPH RAIDY
Sales Engineer
Gasflux Co.
Elyria, O.



Operator loads left jig as brazing is completed in right one



One Gasfluxer installed between two machines serves both

Three Ways To Cut Brazing Costs

THE VARIETY of cost-lowering ideas that can be brought to bear on a production brazing job is illustrated in the development of procedures at Erie City Mfg. Co., Erie, Pa. The company fabricates frames for hospital equipment from carbon steel tubes.

In the manufacture of steel tube assemblies it is common practice to design a jig for each model. The jig holds the tube parts in place while joints are brazed with hand torches, using a low fuming bronze filler rod. Erie City adopted this method, and then modified it.

First Change—Silver brazing alloy was substituted for the bronze rod. Trial runs showed the lower melting point of the silver alloy made it possible to do a satisfactory job of heating with a gas-air flame. And this could be done within a couple of seconds of the time required to heat for bronze brazing with a higher temperature flame.

For best economy, fabricated silver alloy brazing rings are used as filler material for all joints. They provide exactly the amount of material needed to fill the joints with no overflow or build-up.

The joint is smooth and inconspicuous. A particular advantage of the silver alloy in this application is that it does not show through the plating.

Second Change — Brazing machines for several subassemblies were installed. Their design allows the operator to load and unload the work while the machine does the brazing.

To get the close fit necessary for

uniformly high quality silver brazing, the tube ends included in the joints are milled to a tolerance of 0.0002 in.

Operation — The machine has two brazing stations. Each is equipped with seven gas-air burners placed so all the joints in one subassembly are brazed simultaneously. Pilot lights are kept burning at the tips of the burners so they can be lighted by a solenoid switch.

Angle iron rails along the sides of the machine support a rolling carriage which has two identical work-holding jigs. The two brazing stations are separated by about the length of one jig. The operator's position is opposite the middle of the machine.

Continuous—When he is loading the left jig, the right one is in position for brazing. By the time he has finished loading, the brazing is completed and the burners are extinguished. The carriage is rolled to the left, brazing is started by turning the solenoid switch, the operator removes the brazed subassembly and starts loading the right jig.

With this machine, the brazing operation is fast and efficient. However, production was slowed because of the time required to remove flux residue before plating. When paste flux was brushed on, there usually was an excess.

Third Change — Vapor fluxing took care of the cleaning problem. On some joints, the use of paste flux was continued to promote capillary action, but the flux was thinned down five to one with water.

Equipment for vapor fluxing is a container called a Gasfluxer, made by the Gasflux Co., Elyria, O. It is connected into the fuel gas line which supplies the burners. The container is charged with a compounded flux held in solution in a highly volatile liquid.

The gas passes through the container, picks up a regulated amount of flux and delivers it to the burners. The flux is in the flame, and is active where the flame touches. There is no residue, no discoloration and no cleaning problem. After a water rinse to remove surface dirt, the brazed assemblies go directly to the plating department.

Under punch card control, a slab whips through the 56 in. universal roughing mill in Allegheny Ludlum's Brackenridge Works. Inset: The roller feeds a card to the reader

Rolling: It's in the Cards

THE YEAR of the punch card (see "Machines that Obey Orders," p. 68) got started early at the Brackenridge (Pa.) Works of Allegheny Ludlum Steel Corp. In August the company began installing a punch card control system for a 56 in. universal roughing mill. By October it was rolling steel, with no shutdown since.

Why punch card control for a rolling mill? Allegheny Ludlum engineers say the first reason is uniform quality—not higher output. But higher output will be important later when the company finishes installing additional soaking pits to keep up with the increased capabilities of the mill.

Uniformity—With manual control there's always some variation in the product. Each roller has his own sequence of passes and reduction to reach the desired size. The differences can show up especially in nonuniform grain structure.

This is one variable which punch card control can eliminate. A rolling expert decides on the best method to roll each size and grade, and from then on the sequence is always the same.

Card control is being applied first to the rolling of electrical silicon steels. With these, uniformity of grain structure is particularly important. Stainless is next on the program, but the great variety of grades and sizes, and the infrequency with which some of them are rolled makes the coding problem bigger.

Control—The punch card system was developed, manufactured and installed by General Electric Co. One card is required for each grade of steel, slab size and reduced size. A single card can handle 15 passes, six roll speeds, and roll openings accurate to 0.01 in. at screwdown speeds up to 40 in. per minute.

The operator is still much in the picture. The card reading device flashes a light when the mill has completed a pass, and the roller must push a button to actuate the next pass. This gives him full control in the event of a sticker or mill breakdown.

Although the card control has been operating only about three months, results have been so good that the company is seriously studying other areas in the Brackenridge mill where it can be used to advantage. There's no engineering reason why it can't be applied to a continuous mill.

GE also is building automatic control units for reversing mills. They're ordered by Bethlehem, Inland, J&L and U.S. Steel.

USCOWELD PLASTIC PIPE FITTINGS

Greater Joint Strength—Faster Insertion—Thanks to

THE ONLY SOLVENT-WELD FITTING WITH AN INTERFERENCE FIT!

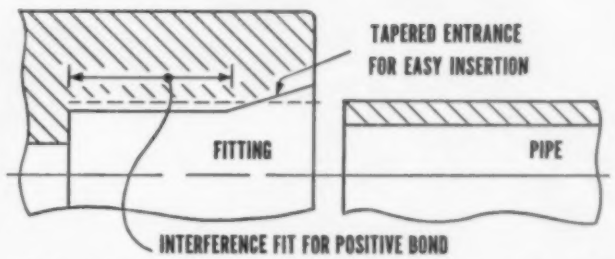
To get maximum joint strength, interference fit is a must! UscoWeld fittings are designed to provide at least a .005 inch *interference fit*. And UscoWeld fittings are a cinch to install because of a specially designed *tapered entrance socket*. U. S. Rubber has developed the unique UscoWeld fitting of the same tough, lightweight, corrosion-resistant thermoplastic as famous Uscolite® CP plastic pipe.

All UscoWeld fittings can safely handle the pressures recommended for the corresponding size of extra-heavy Uscolite pipe. Maximum recommended operating temperature is 170°F. Pipe can be cut to exact length, is easily installed in close quarters.

Obtainable at any of our 28 District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

In Canada, Dominion Rubber Co., Ltd.

THE USCOWELD PRINCIPLE



By combining tapered entrance socket and a .005 inch interference fit—even when the pipe is at the small limit of the diameter tolerance and the fitting at the large limit of its diameter tolerance—UscoWeld is easily installed, and the strongest solvent-weld joint available.

Apply Uscolite CP cement to the outside area of the pipe that is to be in contact with the socket.

Next apply cement uniformly to entire inside area of *tapered entrance* socket.

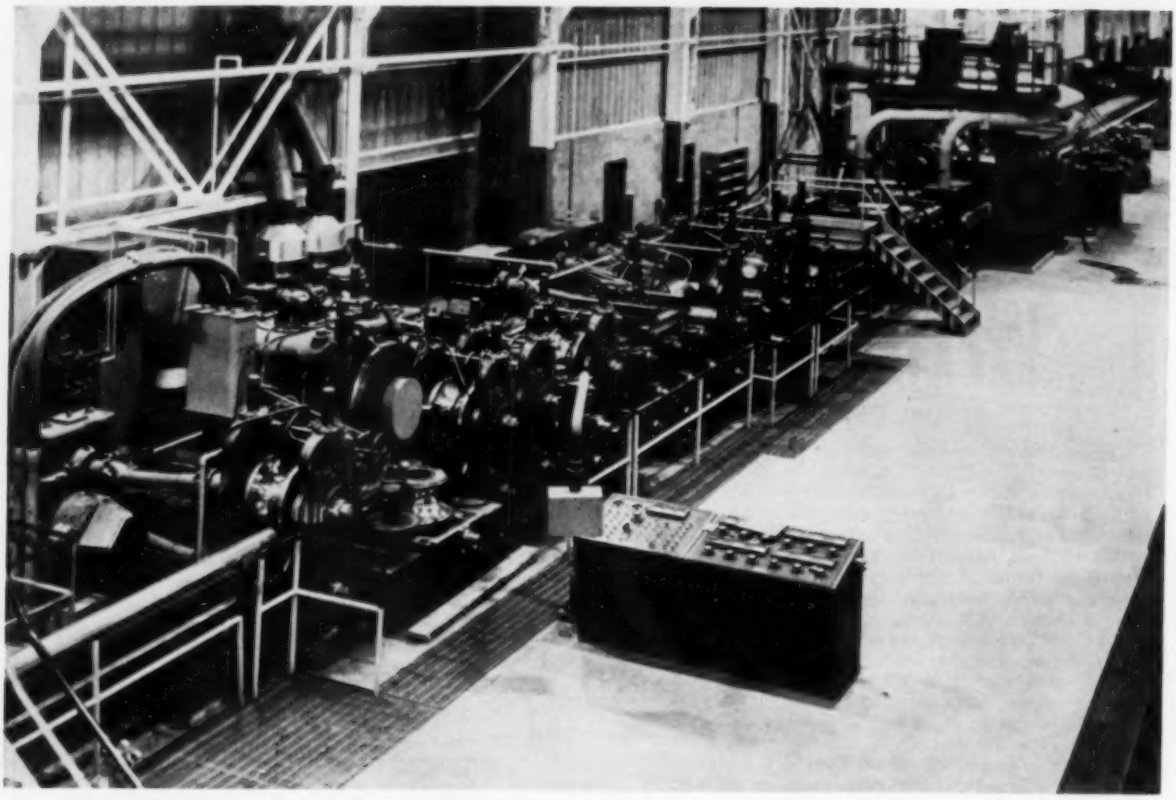
While both cemented surfaces are still wet, insert pipe in fitting and push until pipe bottoms against shoulder in the fitting.

ADVANTAGES

- fast, easy to assemble—tapered entrance provides easy insertion of pipe
- strong joint—interference fit provides for optimum fusion of pipe and fitting into homogeneous mass; joint strength not dependent on cement alone
- automatic alignment of pipe and fittings
- chemical resistance of the UscoWeld joint is the same as for Uscolite pipe
- UscoWeld takes maximum advantage of the inherent "solvent-weldability" of plastic pipe and fittings
- no threading required—just cut pipe square
- not necessary to allow for thread make-up variation—pipe can be cut to exact lengths
- easy to install in close quarters
- resists fatigue due to vibration or thermal stresses by elimination of stress concentration at thread roots.

Mechanical Goods Division

United States Rubber



Forming and welding sections of Alberta Phoenix Tube & Pipe's new mill. The Wheelabrator shotblast unit can be seen at upper right

Pipe Mill Is Electronically Controlled

Canada's newest, it forms, welds and cuts steel pipe to length automatically. It can produce 3½ to 12¾-in. OD in 0.105 to 0.375 gages. Output will help relieve shortage

MOST MODERN, completely automated, resistance-weld steel pipe mill in the Western Hemisphere: That's the claim Alberta Phoenix Tube & Pipe Ltd. makes for its new $6.5-million mill outside Edmonton, Alta., Canada.

Situated on a 70-acre site, the mill will help ease the shortage of steel pipe for the mushrooming Canadian oil and gas fields. It will produce more than 100,000 tons of pipe a year, ranging from 3½ to 12¾-in. OD.

Automatic — The big U-shaped mill line has an electronically controlled direct-current drive. No workman touches the pipe from the time it enters the line as skelp until it is loaded onto waiting flatcars in finished lengths.

The drive is sized to provide high speed production: Up to 150 fpm at the entry section to close gaps between successive coils of strip, 80 fpm for small diameter, light gage (0.105) pipe, and 30 fpm for heavy gage (0.375) pipe. Normal production speed for 0.237 gage, 12¾-in. pipe is 80 fpm or 80 tons an hour.

The mill line is divided into four general sections: Entry, edge conditioning, forming and welding, and cooling and sizing.

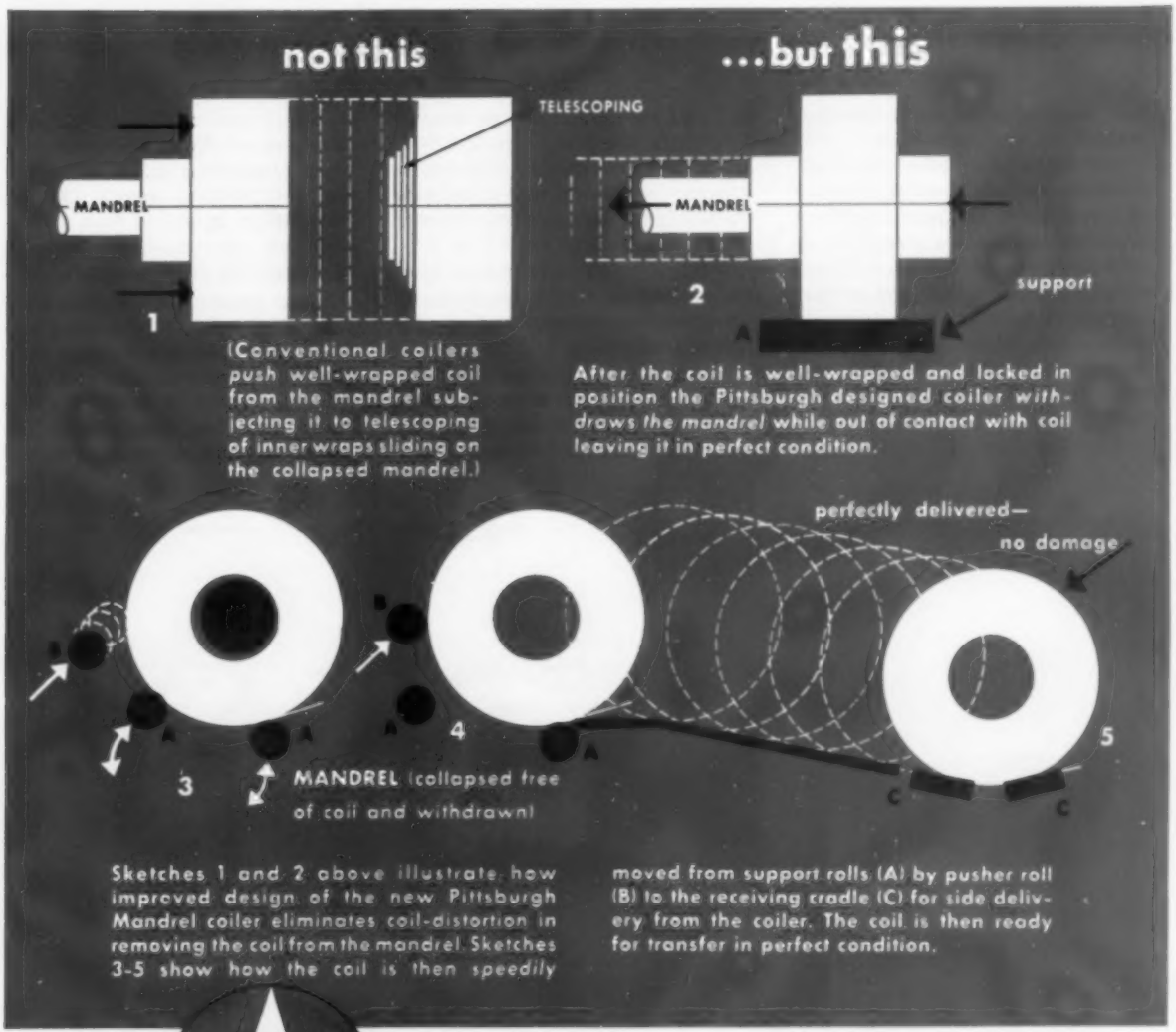
Entry — Coils of skelp feed by gravity from a coil ramp to cone payoff reels which have friction drag brakes to provide back tension.

The coil is stripped and fed to a flattener and end cropping shear

New hot strip coiler

by Pittsburgh

Delivers each coil in perfect condition



(Conventional coilers *push* well-wrapped coil from the mandrel subjecting it to telescoping of inner wraps sliding on the collapsed mandrel.)

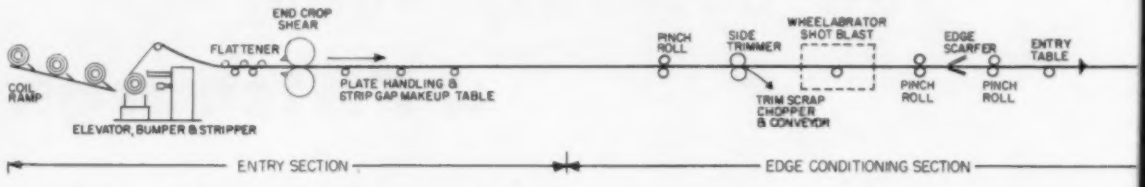
After the coil is well-wrapped and locked in position the Pittsburgh designed coiler *withdraws the mandrel* while out of contact with coil leaving it in perfect condition.

Sketches 1 and 2 above illustrate how improved design of the new Pittsburgh Mandrel coiler eliminates coil-distortion in removing the coil from the mandrel. Sketches 3-5 show how the coil is then *speedily* moved from support rolls (A) by pusher roll (B) to the receiving cradle (C) for side delivery from the coiler. The coil is then ready for transfer in perfect condition.

Pittsburgh
ENGINEERING & MACHINE CO.
Division of Pittsburgh Steel Foundry Corporation

Rolling mill equipment by Pittsburgh performs in a superior manner because it is superior in design. Call us for advice on problems you may have with existing equipment and for quotations on new installations.

P. O. BOX 986, PITTSBURGH 30, PENNSYLVANIA
PLANT AT GLASSPORT, PENNSYLVANIA



Flow of skelp and pipe through the automated mill

and then across a 95-ft powered table.

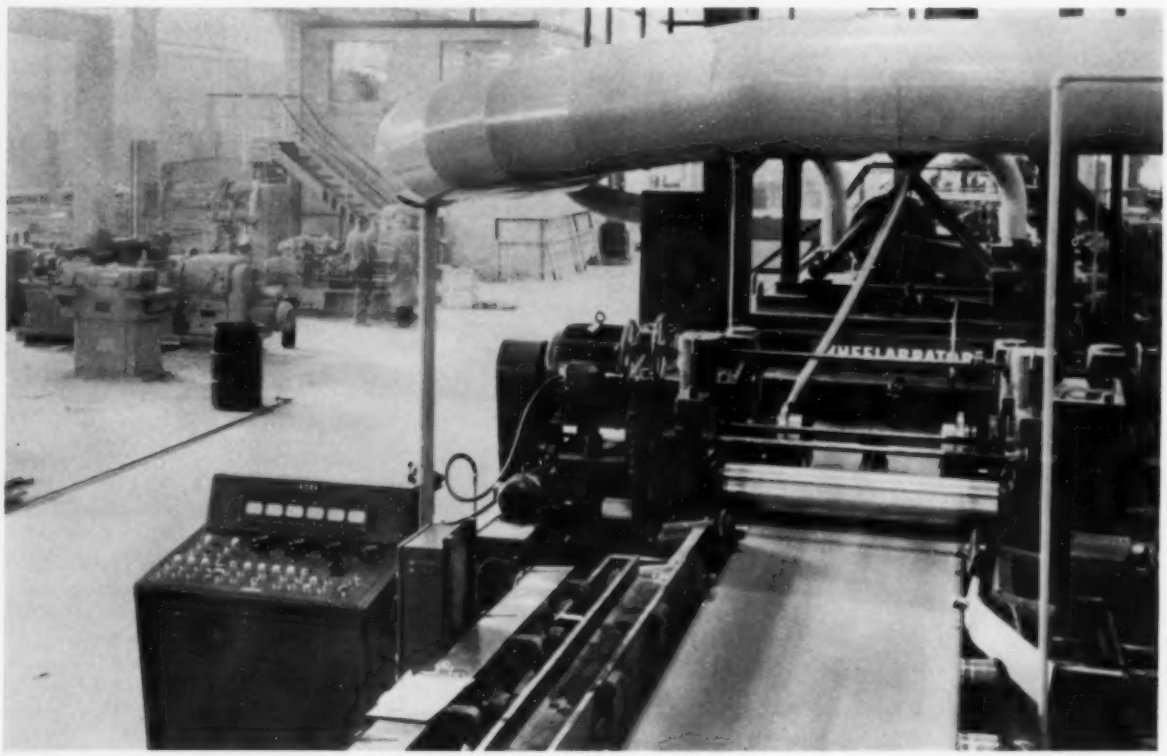
The skelp enters the edge conditioning section through a pinch roll and goes through a slitter-type trimmer and a rotary scrap cutter. It passes through a Wheelabrator shotblast unit and another pinch roll to a scarfing trimmer. It then goes past an exit pinch roll and down a 20-ft inclined mill entry table into the forming section.

Forming—Six of the 11 passes in the forming section are driven. The entry stand is a pinch driven roll. It is followed by two driven breakdown passes, an idler side closing pass and another driven breakdown pass.

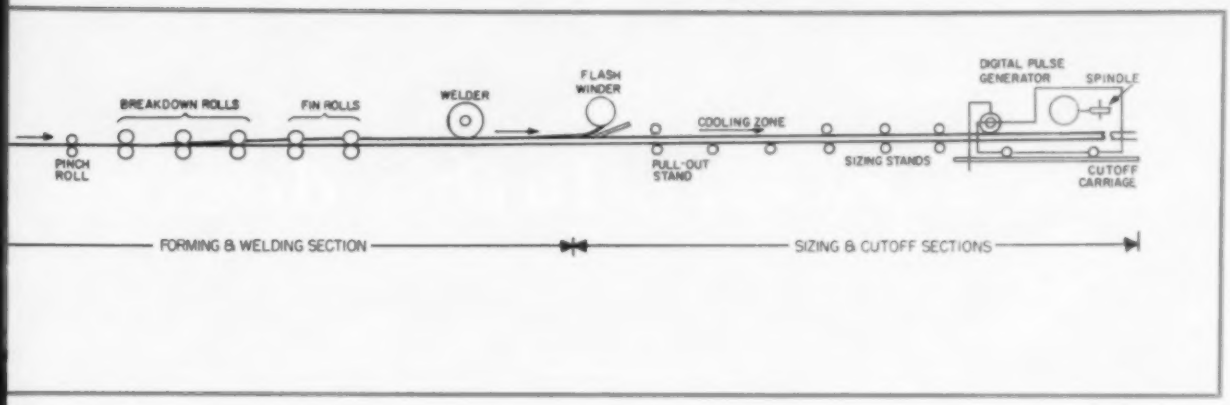
Next come three idler side closing passes, a driven fin pass, an idler side closing pass and another driven fin pass.

Welding — Skelp entering the welding section goes into a seam guide and pressure unit, then into a 750 kva, 120 cps resistance welder which can weld a ¼-in. wall thickness at 65 fpm. Outer and inner diameter scarfing units follow the welding stand; the removed flash is wound on a motorized chip winder driven through an adjustable friction clutch.

Water sprays on the pipe as it passes through a 30-ft cooling section, which has a number of nondriven conveyor rolls and two driven rolls to carry short pieces of pipe to the sizing stands. In the sizing and straightening sec-



Shotblast unit is part of edge conditioning section. At left is one of six Reliance Electric benchboards, from which the integrated drive system can be controlled



tion, the skelp goes through eight passes, four of which are driven.

Cut-Off—The continuously welded tube is delivered from the sizing section to the cutoff. The length to be cut is measured by a digital pulse generator. The cutoff spindle automatically and accurately cuts the rapidly moving pipe into lengths of 16 to 60 ft. The length of pipe can be altered while the mill is operating.

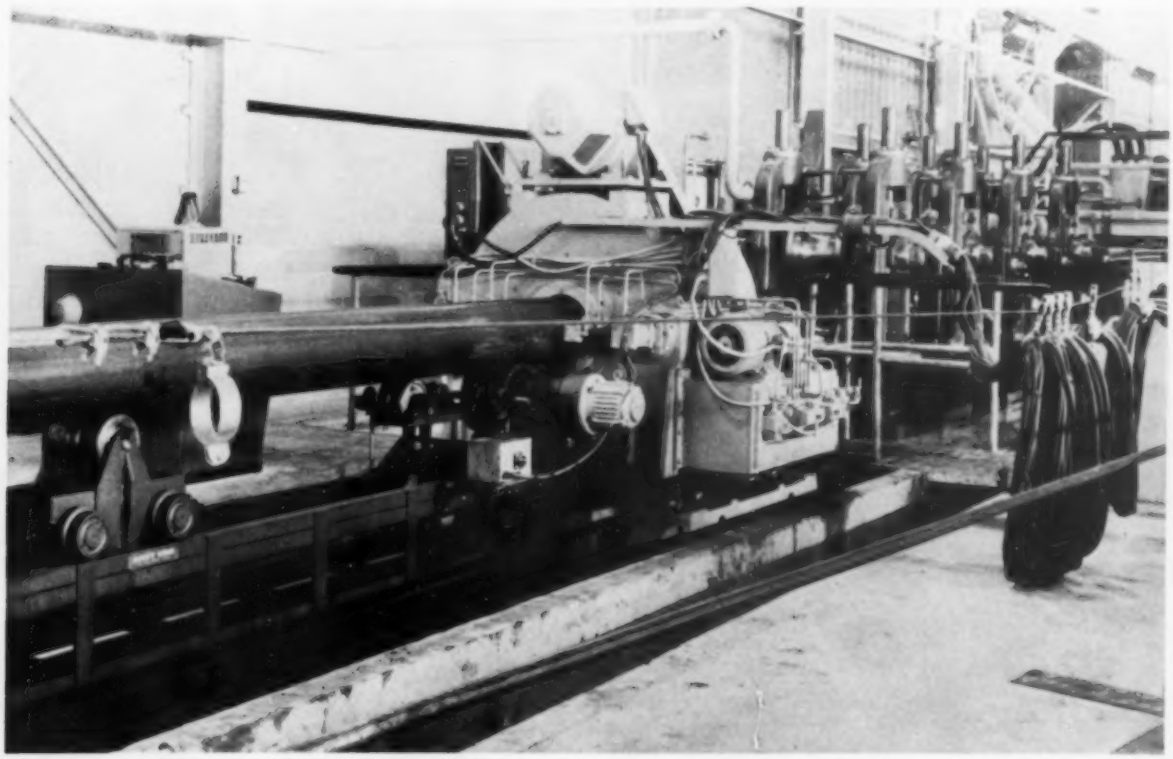
Control relays actuated by the digital counter start the carriage motor and accelerate it to pipe speed.

After a time delay, the hydraulic jaws clamp the pipe, a carbide tool advances and starts cutting at 500 sfm.

After the cut is completed, the jaws open, the carriage decelerates dynamically and then accelerates in reverse to a high return speed. Nearing the starting position, it slows down and comes to a stop, ready for the next cutoff.

Builders — Once cut, the pipe lengths are conveyed to an end crop and facing operation, and then to the shipping area.

Canada's new mill was built by the International Bechtel Corp., San Francisco. Prime equipment contractor was the Abbey-Etna Co., Toledo, O. Stamco Co., New Bremen, O., built the skelp handling equipment and Reliance Electric & Engineering Co., Welland, Ont., and Cleveland, engineered and manufactured the drives and controls.



The digital pulse generator and cutoff spindle accurately measure and automatically cut the moving pipe into 16 to 60-ft lengths

LeBlond customers report:

New REGAL lathe design

Recommended by machine shop operators

it is the best lathe I have found in 35 yrs experience

Best Tool Room lathe I have used in the past 14 years, also Best Lathe for the money.

I liked the looks and the Rigidity.

P.S. I also have another one on order.

more for my money

scores high with operators

"Satisfied" or "well pleased" report 95% of new Regal operators! Source of these figures is the LeBlond Use-Check Questionnaire, which we send to all new LeBlond lathe owners—a direct method of learning what industry wants, needs, likes (or dislikes) in its lathes. Actually, the new Regal Lathe is designed largely around suggestions and ideas expressed by our customers in Use-Check Questionnaires of recent years.

What do the owners say about the new Regal?

Best-liked Regal features proved to be hardened bedways, electric brake and the speed range. 73% of the new Regals are being used in the toolroom or on the production line. Here's how some of the other questions and answers ran:

Q. "*Is production rate what you expected?*"
A. "Satisfactory or better" (96%).

Q. "*accuracy?*"
A. "Satisfactory or better" (97%).

Q. "*finish?*"
A. "Satisfactory or better" (96%).

Q. "*convenience?*"
A. "Satisfactory or better" (93%).

Q. "*Why did you select a LeBlond?*"
A. "Best dollar value." "Previous experience" (two biggest reasons).

At left are some of our customers' comments in their own handwriting.

The reason for this overwhelming acceptance of the new LeBlond Regal can be summed up very simply. It is what industry has been asking for—performance-wise, feature-wise, price-wise. Your LeBlond Distributor will give you all the details. Call him today, or write.

. . . cut with confidence

LEBLOND of Cincinnati

THE R. K. LEBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio

Designed and built like heavy-duty lathes, the new LeBlond Regals will give you a long life of precision production, minimum maintenance and the kind of dependability you'd expect from a much higher-priced machine!

13" and 15" Regals

The new Regal headstock uses the same combination gear-belt drive construction that proved itself on the famous LeBlond Dual-Drive and is now incorporated on our new 16" heavy-duty lathe. The new bed has hardened and ground replaceable steel ways like the ways on our heavy-duty machines. They are fitted according to the compensating veeway principle to insure better distribution of forces for proven long-time accuracy and minimum wear.

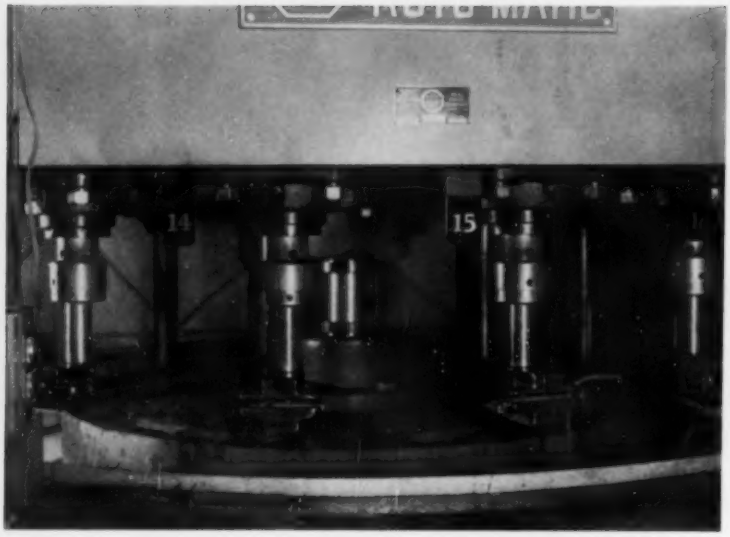
17" and 19" Regals

Again, like higher-priced lathes, Regals are equipped with both feed rod and leadscrew for continued accuracy in thread chasing. Other big-lathe features — 3-bearing spindle. Automatically-lubricated quick-change box. Wide carriage bridge with ample bearing surface. Rugged tailstock with plug clamping. Plus general dimensions and construction details patterned after LeBlond heavy-duty lathes.

13" Regal Bench Model

All of LeBlond's 70 years of experience has gone into the design and building of these new Regals. Only from the builder of a complete line of lathes can you get a low-priced lathe with big-lathe features.

World's Largest Builder of A Complete Line of Lathes for More Than 70 Years



Interior view of Roto-Matic shows spindles and clamping devices to hold stainless turbine buckets

Deburring machine in action. Chip mass and spindles travel in opposite directions

Deburring Is a Precision Process

At Ford's aircraft engine plant in Chicago, machines deburr parts to almost machining accuracy. The time saving over hand deburring with files or power tools is enormous

"PUT THAT machine out of order and we'd need at least eight men to handle the deburring of those stainless turbine buckets," says Walter Mueller, process engineer at Ford's aircraft engine plant in Chicago. "And," he adds, "using hand equipment, the men couldn't do the job with the same precision as the machine."

Mr. Mueller is in charge of the plant's Roto-Finish department. He's talking about a 16-spindle Roto-Matic machine that's timed for a 7 minute 45 second cycle, including loading and unloading. Fixtures on each spindle hold the parts and index them through a mass which revolves opposite to spindle travel. The mass is water, granite chips and a soap compound which lubricates and cleans chips and parts.

Action—That machine is only one of 35 in the department. All tumble the parts through a wet mass. Parts being deburred include a variety of sizes and shapes made of titanium, stainless, magnesium, aluminum and carbon steel alloys.

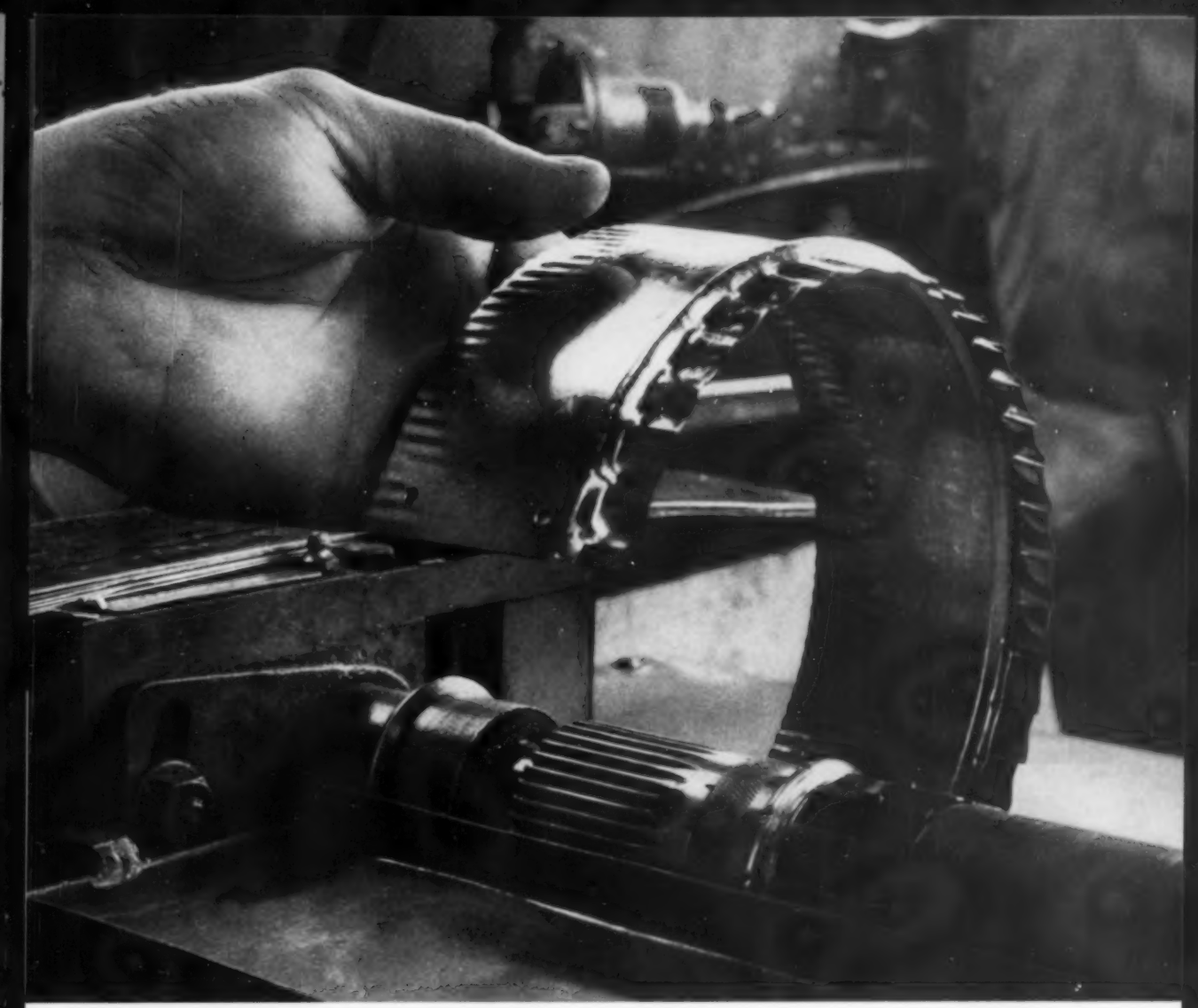
Deburring is the primary job of the equipment, but it also improves surface finish, polishing and cleaning the parts. They come out metallurgically clean, suitable for welding. Other possibilties of the equipment: Britehoning, coloring and descaling.

Machines Vary — Most of the machines are multiple compartment with conventional tumbling action—some have 15 compartments. One or several parts may be placed in a compartment. The number depends on the size and shape of the part as well as the job to be done.

Several machines operate on a dual-action principle. In these, parts are fastened to a spider fixture. The fixture revolves in one direction; the barrel with the chips and compound in the opposite. Newest equipment of the Roto-Finish Co., Kalamazoo, Mich., has automatic chip handling.

Several settings are possible from the control board: Processing time, cylinder and fixture speed, chip load and unload, automatic forward and reverse of cylinders and fixtures, including variable time setting.

Stainless Nut—A typical part deburred in one of the 15 compartment machines is a stainless alloy nut 6 in. in diameter and 1¼-in. wide. For this part, two sizes of chips are used: One is ½ x ⅝ in., the other, ⅛ x 3/32 in. Each



"WE USE WEIRKOTE® ONLY— ITS ZINC COATING IS FOR KEEPS!"

You come across that thought a lot when you talk with users of Weirkote zinc-coated steel.

Ask *why* they're so sold and you hear that Weirkote gives a better job at *lower* cost. Weirkote fabricates easily. Takes the toughest crimping, bending, twisting, lock seaming, the deepest draws. Its tight zinc coating stays on for keeps.

With Weirkote zinc-coated steel there's no need for costly protective plating, painting or redipping after fabrication. Makes a good-looking job anyone can be proud of. And it stays that way.

Weirkote is continuous-process zinc-coated steel at its best—highly resistant to corrosion, heat and noise. Cost from sheet to finished product is low.

Send for Weirkote Booklet

Look into Weirkote for added efficiency, economy in your operation. For free booklet, write today to Weirton Steel Company, Dept. A-3, Weirton, West Virginia.

WEIRTON STEEL COMPANY

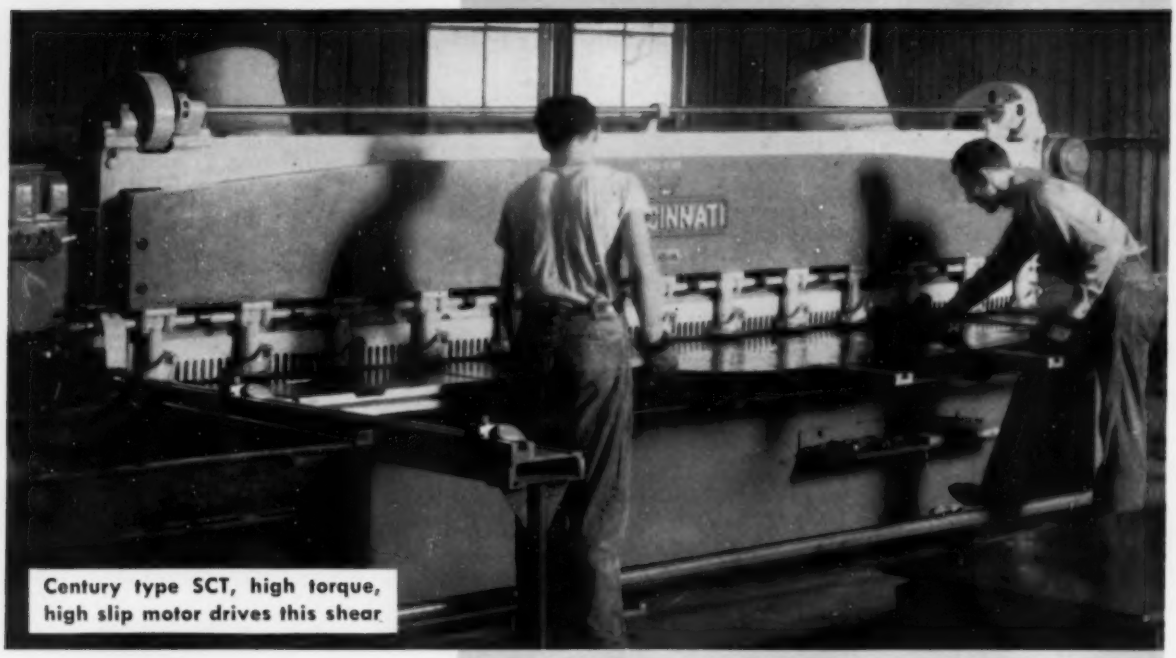
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

designed to absorb heavy peak load...



Century type SCT, high torque, high slip motor drives this shear

Century Performance-Rated® MOTOR EXACTLY FITS THE NEED ON THIS SHEAR

To get full value from your equipment, motor *performance* must match machinery *requirements*. Whether the horsepower need is large or small, Century Performance-Rated Motors can supply the performance characteristics you require.

This shear has a Century Motor selected for proper size, speed, and torque with "high slip" characteristics. When the clutch is actuated, energy stored in the flywheel during the idle part of the cycle is used to drive the shear. As the load comes on, the motor speed pulls down—thus cushioning the shock of the load. This saves impact on the shear and motor, reduces power line surge and permits use of a Century Motor *Performance-Rated* to do the job without excess horsepower.

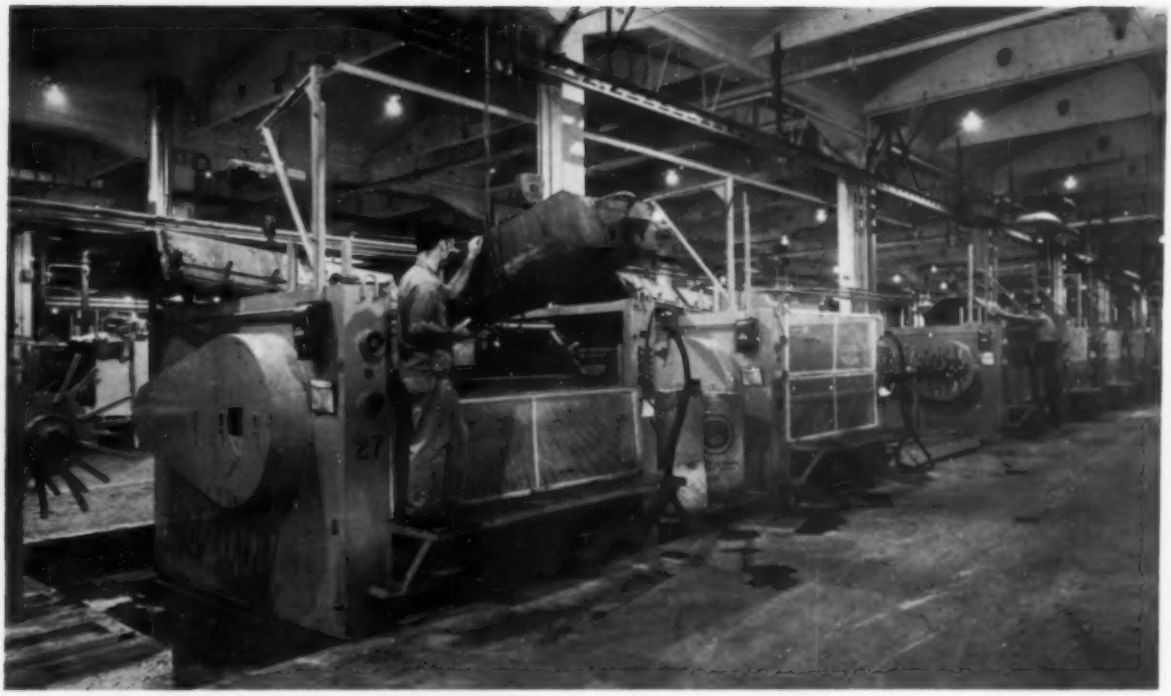
Century Performance-Rated Motors are designed in a wide range of torque, speed, mounting and frame characteristics. Call your nearby Century authorized distributor, or contact our District Sales Office.

Performance-Rated©
MOTORS
1/20 to 400 H.P.

CENTURY ELECTRIC COMPANY

CE 69RR

1806 Pine Street, St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*



General view of barrel tumbling department at Ford, showing chips being loaded into the first barrel

PRECISION DEBURRING . . .

compartment is 16 x 5 in., octagonal in shape.

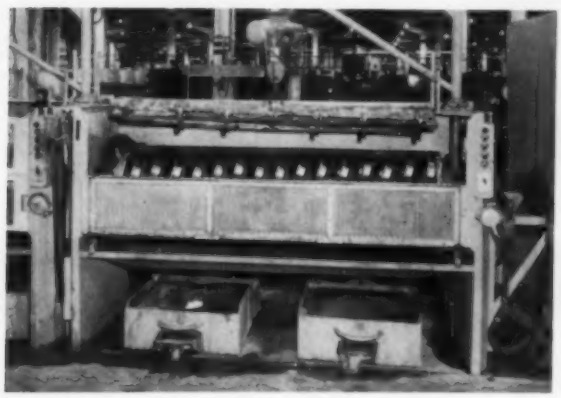
Parts are loaded one to a compartment and tumbled for 4 hours in one direction. For some parts, the machines are set to change the barrel's direction of rotation periodically; 5-minute to 1-hour intervals are possible.

Parts coming to the department must be uniform. Some require minor predeburring by hand to knock off extrusions and heavy roll-over burrs. On the typical nut described, this takes about 2 minutes.

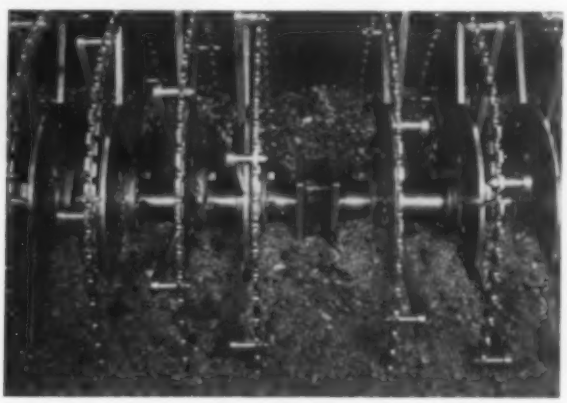
Control—The uniformity of parts coming to the machines permits almost machining accuracy with the process. Edge radius can be held to plus or minus 0.002 in. in most cases and less on Roto-Matic operations.

In addition to the precision of the process, time saving over hand deburring is an important factor. Many of the parts Ford handles would take 2 to 8 hours to deburr by hand with the conventional files, power hand tools and buffing wheels.

Control is accomplished by varying the size of chips used, type of compound, water level and time. Aluminum and magnesium generally take less time to deburr than stainless and carbon steels. Jet engine parts take 1 to 6 hours to deburr at Ford. The average is about 3 hours.



A 15-compartment tumbler. With large parts, only one is placed in each compartment. With smaller parts, several can be put in each compartment



In this tumbler barrel, parts are attached to spider fixtures. Barrel and chips revolve in one direction, spider and part in the opposite

Designed for Strength and Safety

STRENGTH AND SAFETY are built-in features of this seat-belt buckle made from Republic Stainless Steel, Type 201. Fabricating operations include: shearing into blanks of .125 thickness, punching, a severe bend of 175° to form the hook.

SAFETY ASSURED by designing the high strength advantage of stainless steel into the simple beak-type buckle. No intricate springs or mechanisms to fail at the wrong moment. Both belt and buckle are rated 1000 pounds in excess of CAA specifications.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

with STAINLESS STEEL

SEAT-BELT MANUFACTURER LICKS CRITICAL PROBLEM WITH REPUBLIC ENDURO, TYPE 201

Here are the facts on a new and cost-cutting use of Republic ENDURO® Stainless Steel, Type 201, by Bunke-Musser Company, Jackson Center, Ohio, manufacturers of safety seat-belts for the automotive industry.

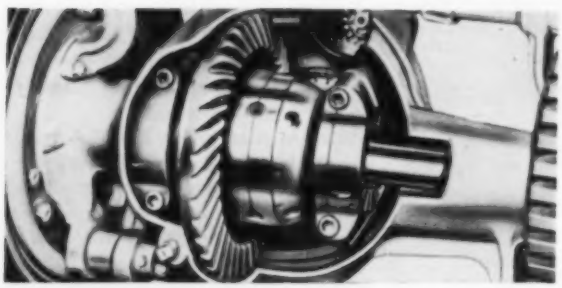
The most critical part of the entire assembly is the buckle. It must conform to Associated Seat Belt Manufacturers' specifications. These require that the buckles be subjected to a test pull of 1500 lbs., then reduced to 125 lbs. At this point, the pelican hook of the buckle must be capable of release at 45 lbs. pressure.

Prior to adoption of Type 201, another grade of stainless had been used. However, the slightly softer surface of this type resulted in a galling action at the fulcrum of the buckle when the release pressure was applied.

Bunke-Musser also experimented with carbon steel. But this required use of heavier gage, chrome plating and polishing, with the end result being much more expensive than stainless steel.

Now the company has standardized on Republic, Type 201, with excellent results. The buckles meet and exceed test specifications. The galling action has been eliminated. Tensile strength increased 200 lbs.

Types 201 and 202 are relatively new members of Republic's family of stainless steels. Republic Specialists will be happy to work with you in designing these new grades into your product. The 200 Series offers high strength, corrosion-resistance and easy forming on your present equipment. And they are readily available. Mail the coupon for more information, or if you would like a Republic Specialist to call at your plant. There's no obligation.



THERE'S NO SACRIFICE OF STRENGTH OR SAFETY in this drive axle designed from Republic Alloy Steel. In these fine steels you will find the highest strength values—plus an exceptionally high strength-to-weight ratio that permits transmission of hundreds of horsepower through tough, strong axles, shafts and gears, free from excess weight. Republic Alloy Steels are essential in designing smaller sections to carry heavier loads safely—essential in extending equipment life and reducing maintenance and replacement costs. Send coupon for data.

A BUILT-IN SAFETY FACTOR is one reason why Republic Nylok Nuts are being used in thousands of critical applications to resist shock, vibration and cyclic loading. The answer is in the nylon plug in one face of the nut which forces threads on other side tight against bolt or stud. Above, Nylok Nuts provide a powerful clamp action and keep vital steering tie-rod assembly securely in adjustment. Nylok Nuts can be removed for maintenance of parts, then re-used with no loss in holding power. And because either end is up they are ideal for automatic feeding and power wrenching. Send coupon for more facts.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-2865,
3120 East 45th Street • Cleveland 27, Ohio

☐ Please have a Republic Specialist call.
Send more information on:
☐ 200 Series Stainless Steel ☐ Alloy Steels ☐ Nylok Nuts

Name _____ Title _____
Company _____
Address _____
City _____ Zone ____ State _____

Clean and simple, Le Claire's furnace has its burners mounted at the rear. Charging is from the side at the left of the operator. Both aluminum pig and scrap are melted in the furnace

Melting Change Brings Savings

A small aluminum foundry and diecasting shop finds a furnace that conserves space, improves casting quality and saves dollars in the melting operation

A DRY hearth melting furnace for soft metal has resulted in savings of $350 a month at Le Claire Mfg. Co., Le Claire, Iowa. The firm makes lawn mowers, garden tractors and aluminum castings for such products as vacuum cleaners, carburetors and motors.

The double chamber furnace, manufactured by Eclipse Fuel Engineering Co., Rockford, Ill., melts the metal on a sloping hearth and holds it at 1400°F in a dip-out chamber which has a capacity of 700 lb. It was designed primarily for production-line diecasting, but this relatively small foundry has also made highly efficient use of it for sand casting. It replaces two crucible furnaces and an old reverberatory, making valuable space available.

To Spare—Its melting capacity (400 lb per hour) is enough to supply all the aluminum needed for sand and diecasting and provide sufficient extra capacity to double production. (The company expects to do this when it installs a new automatic core shooter.) Rejects have been eliminated, and castings are made free of blowholes, oxide inclusions or other defects.

The possibility of moisture entering the molten metal has been almost completely eliminated. The hearth is dry to begin with, and moisture in the pigs is driven off during the melt. It mixes with products of combustion and is carried out of the furnace through the flue. Close temperature control prevents overheating, so the metal does not absorb moisture from furnace gases or air.

No Burn—Holding bath temperature is sensed by a thermocouple in the dip-out vestibule on the working side of the furnace. It is controlled within close limits by an automatic valve. Metal trickling into the holding bath from the melting chamber is almost the same temperature as that already in the dip-out vestibule.

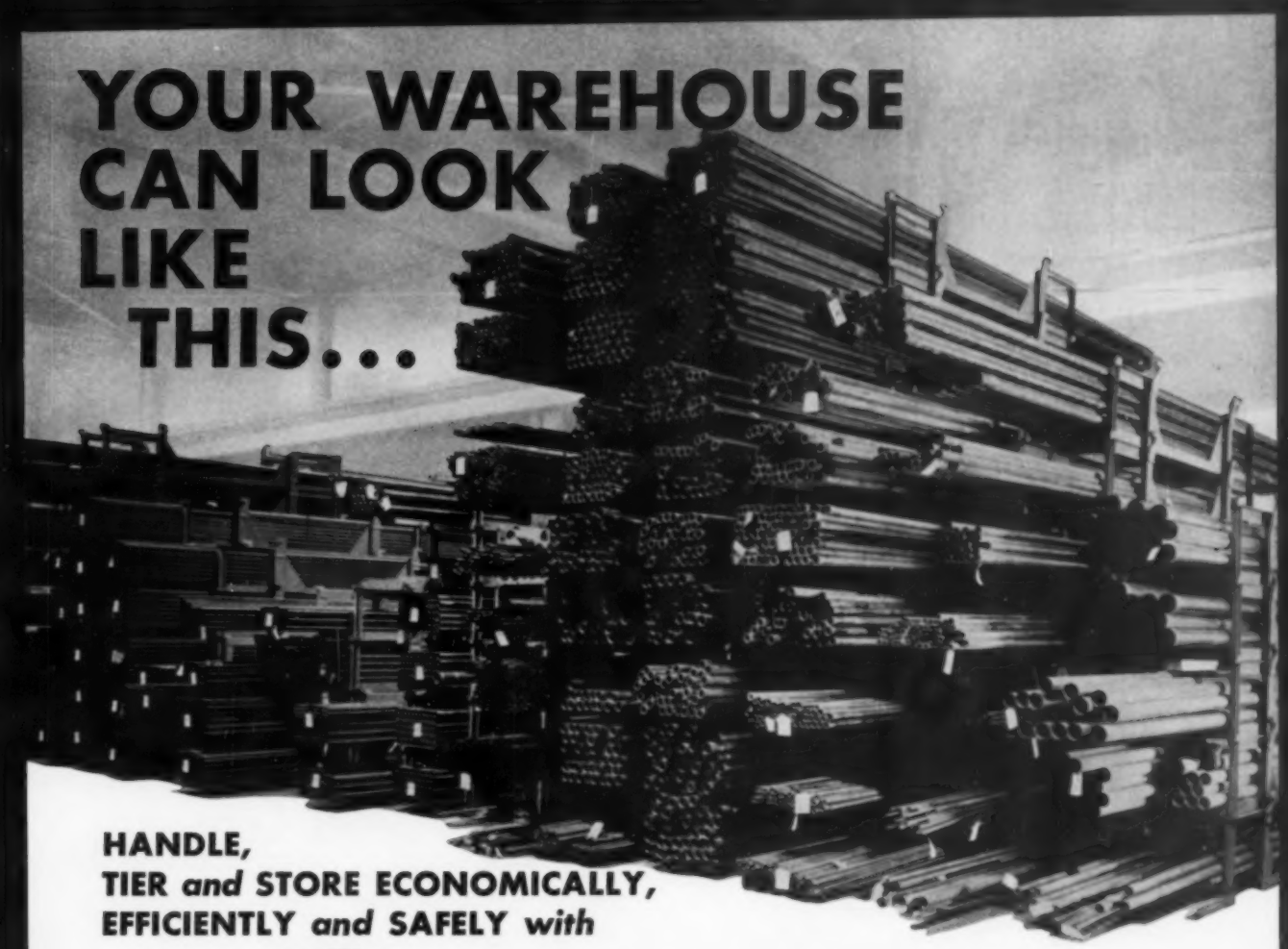
The bath is quiet. Metal flowing down the chamber wall from the hearth cannot agitate it. A slight film of oxide forms on top of the molten metal and protects the metal below. As long as it is not disturbed, it prevents additional oxide from forming.

Oxide inclusions in scrap, gates or risers are deposited on the sloping hearth instead of being carried into the holding chamber. These particles are easily removed by raking the hearth.

Heat—Eclipse "CF" straight oil burners fire directly over the metal, speeding up the melting process without overheating. Heat input is rated at 800,000 Btu per hour. A constant burning pilot keeps the furnace warm during shutdown periods.

The furnace has been in continuous operation for over six months and has required no maintenance. It has resulted in a fuel cost saving of 2 cents per pound of metal melted.

YOUR WAREHOUSE CAN LOOK LIKE THIS...



HANDLE,
TIER *and* STORE ECONOMICALLY,
EFFICIENTLY *and* SAFELY *with*

CONSULT P-S FOR THE BEST

PORTABLE *Heavy Duty* BAR RACKS

P-S Rack pick-up by PALMER-SHILE AUTOMATIC TONGS suspended from overhead crane.

Item No. C-497

P-S Racks have flush top and bottom, with full wrap around crane bars. In addition to the full wrap around crane bars, an extra thickness of lift bar is welded for strength and safety.

P-S Racks picked up with automatic tongs—tiered to any height from cab operated bridge crane.

P-S Racks are design-adapted for simple selection using overhead crane.

Why do it the OLD WAY? . . . an investment in ultra-modern Palmer-Shile portable heavy duty bar racks will pay off many times over by eliminating inefficient, money-wasting stock handling and storage methods.

Besides making it so simple, so convenient and safe to tier and store all kinds of bar, sheet, pipe, tubing and other stock, P-S racks also act to prevent damage to stock from the time it arrives at your plant through every handling and storage step.

Flush bottom insures sturdy, rigid, safe tiering—rack upon rack. Heavy gauge steel safety stacking pockets on rack corners eliminate danger of rack slipping or falling. Double thickness lifting lugs welded to wrap around channels, for maximum strength and safety.

Engineered-built to your size and weight specifications. Let our engineers explain how P-S racks add to the efficiency and economy of your manufacturing operations.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16025 Fullerton Avenue, DETROIT 27, MICHIGAN

136 Dartmouth St., BOSTON 16, Mass., COmmonwealth 6-0570 • 1209 Burlingame Ave., BURLINGAME, Calif., Diamond 2-0823 • 13 South Austin Blvd., CHICAGO 44, Illinois, AUstin 7-8599 • 857 Leader Bldg., CLEVELAND 14, Ohio, SUperior 1-3235 • 3301 Walnut St., DENVER 5, Colo., Alpine 5-3984 • 202 Genesee Bank Bldg., FLINT, Michigan, CEdar 8-6881 • 2609 S. Broadway, FORT WAYNE, Indiana, KEnmore 5408 • 835 No. Capitol Ave., INDIANAPOLIS 4, Indiana, MElrose 5-2587 • 6440 Fleet St., LOS ANGELES 22, Calif., RAymond 3-3733 • 5107 Columbia Ave., ST. LOUIS 9, Mo., PRospect 1-1474 • 199 Main St., WHITE PLAINS, N. Y., White Plains 6-1354.

Wire Rope Tricks

Here's how to get more life, cut replacement costs. Tips come from well-known producer

IF YOU want more service from your wire rope, shift it periodically to distribute wear, and reverse its position on the drum.

Engineers at the Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., New York, say wire rope used for hoisting usually wears severely at only two or three points along its length. Replacement is often necessary when the major portion is still serviceable.

Sheave Effects — Critical wear points include those in contact with sheaves as the load is picked up, and those surfaces touching the drum as the load is accelerated. Another point often overlooked is the drum flange. In multiple layer winding, rope rubs the flange until it reaches the next level.

Sheave wear is greatest during the pickup period. Speed is increased causing slippage between sheave and rope.

Acceleration also increases tension, elevating the radial pressure. That causes more wear.

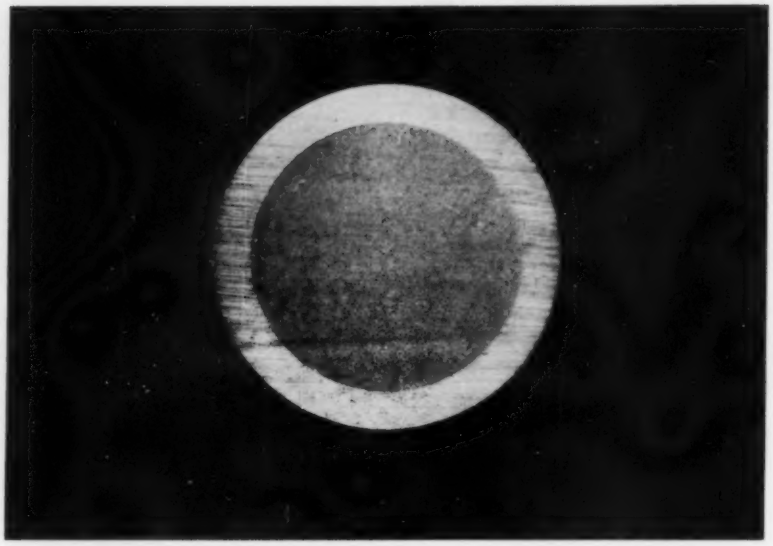
Suggestions — Shift your rope several times during its lifetime to distribute severe wear over a longer length. You can do this by buying a longer piece than you need. Cut some off from time to time to advance unused sections and relocate the portions that are worn most.

Reversing the rope is another method that works well. The drum end becomes the load end. Remember, though, this tactic won't work if wear is concentrated at the midpoint.

Wickwire engineers also point out that there is no substitute for regular, thorough safety inspection.

Computer Symposium

Automatic coding will be discussed at a symposium on digital computers Jan. 24 at Franklin Institute, 20th & Parkway, Philadelphia. The institute's new Univac will be shown.



Photomicrograph (X20) of 0.104 in. diameter Copperply emphasizes the precise concentricity and uniform bond of electroplated copper coating to steel core

Copper Wire Has Steel Core

A NEW, copper-clad steel wire promises significant economies for the communications industry.

Its steel core gives the material a high tensile strength (up to 250,000 psi) and its heavy copper coating (0.0228 in. thick on 0.242 in. diameter wire, 37.5 per cent by weight) results in good electrical conductivity, bright finish and resistance to fatigue and corrosion.

Uses—The biggest volume application is expected to be in telephone, telegraph and railroad signal lines. It costs less than solid copper wire and can eliminate up to one-third the poles required for supporting solid copper lines. It also provides a higher safety factor, less sag and greater resistance to storm and ice damage. Other uses: Woven wire fence that would never require painting and would outlast galvanized fencing; masonry building ties that would never rust through.

The copper coating is joined to the steel core in a permanent bond that permits twisting, stranding, weaving, braiding, bending or flattening the wire without rupturing the bond.

Producer—The new wire is an addition to the Copperply line of National-Standard Co., Niles, Mich. It is available in two grades—30 and 40 per cent conductivity and in high and extra high strength classes.

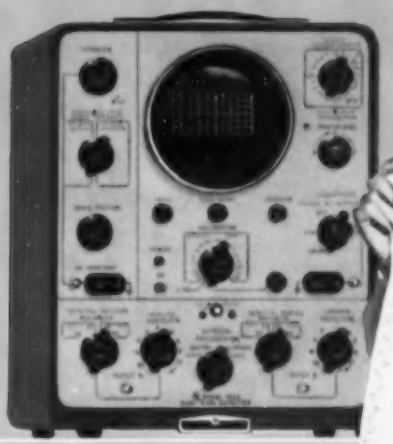
Earlier Copperply wire (it was introduced in 1953) contained 5 and 10 per cent copper content by weight. Its primary uses have been in television antenna lead-in wires, tinsel, jewelry chain and building tie wire.

Cladding Process — Uniformity of the coating thickness on the new material is held within 1 per cent of wire diameter. The production process is based on improvements in the Kenmore plating process (STEEL, June 11, 1956, p. 129).

Helical lengths of steel wire are electroplated in a special bath that produces an unbreakable bond of copper and steel. They are finished to size by precision drawing.

The wire is produced in all standard sizes from No. 1 to 12 AWG (American Wire Gage). The core is available in a wide range of strengths and hardnesses.

A woman's place is in the home?



HEWLETT-PACKARD'S NEW, MODEL 150 OSCILLOSCOPE

Not any more... and Hewlett-Packard Instruments project them into highly technical occupations!

But no matter who operates them, it *is* logical that Hewlett-Packard's ability to design their complex, electronic instruments would be reflected in their demand for efficient and economical assembly methods.

That's why, almost without exception, Hewlett-Packard depends on Sciaky resistance welding techniques and equipment to satisfy their rigid specifications for fastening—aluminum cases of all sizes and shapes . . . complex chassis assemblies . . . even precision variable condenser stators and rotor assemblies.

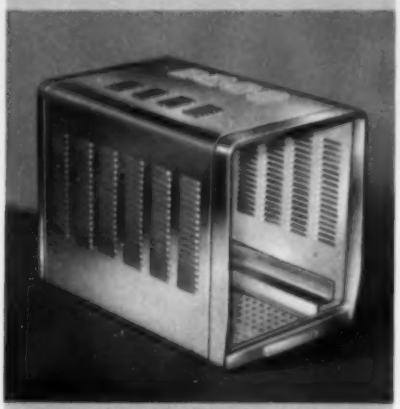
Putting the profits back into manufacturing is the Sciaky concept of design. So, whether or not *you* make instruments—assemble the metal pieceparts of *your* product to best advantage with Sciaky resistance welding techniques—like Hewlett-Packard does!

SCIAKY

Largest Manufacturers of Resistance Welding Machines in the World

Maybe the details of Hewlett-Packard's operation on the next page will help you improve your own

● **OSCILLOSCOPE CHASSIS**—resistance welding 12 piece parts of 14 and 12 ga. 52S aluminum; 80 spot welds per chassis; 40 chassis per day with two welders.



● **SIGNAL GENERATOR CABINET**—resistance welding 8 piece parts, 14 ga. 52S aluminum and cast bezel; 55 welds per cabinet; 16 cabinets per hour with two welders.

● **VARIABLE CONDENSER**—projection welding 6 piece parts to high accuracy in one stroke; 350 condensers per day with two jigs, one operating, one loading.

Sciaky Resistance Welding Techniques increase production 150%

Better product quality, easier assembly are additional benefits

For Hewlett-Packard Company, Palo Alto, California, leading electronic instrument manufacturer, Sciaky Resistance Welding Techniques have provided four basic cost cutting production advantages—

1. **Increased production—as much as 150%.**
2. **Elimination of fit-up problems of riveting.**
3. **Simplified quality control procedures.**
4. **Adaptability of equipment to pilot runs without costly tooling.**

So successful have Sciaky Resistance Welding Techniques been —even on jobs where other equipment failed—that Hewlett-Packard is now designing all new products for Sciaky Resistance Welding. And old products are being redesigned to take advantage of this economy, too.

Described at the right are a few of the jobs being done at Hewlett-Packard with Sciaky Resistance Welding Techniques *designed to put the profits back into manufacturing.* These and other jobs are described in greater detail in "Resistance Welding at Work," Vol. 5, No. 2. Write for your free copy today.

Largest Manufacturers of Resistance Welding Machines in the World

SCIAKY

Sciaky Bros., Inc., 4928 W. 67th Street, Chicago 38, Illinois POrtsmouth 7-5600

Vertical Boring Machine Preselects Feeds and Speeds

This line of vertical boring and turning machines is fully electrical in operation.

All controls are conveniently located on the moveable pendant station and on an auxiliary control panel mounted on the machine.

There are 24 feeds ranging from 0.0016 to 0.250 in. per revolution of the table. There are 24 speeds in any one of three standard ranges—low, intermediate or high.

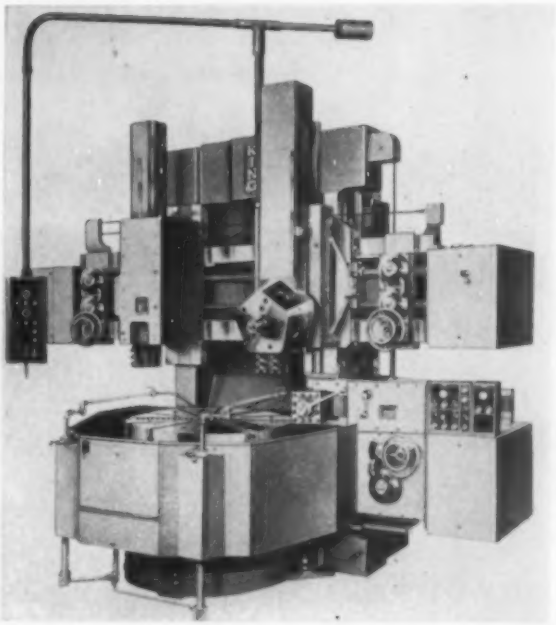
The spindle and its mounting provide the table stability needed for accurate machining. Unit construction of the spindle drive makes maintenance easier.

Antibacklash nuts are used on crossfeed movements. All moving parts are lubricated automatically.

The machines are made in sizes of 30, 36, 46, 56 in. and up. They come in a wide variety of head combinations, with or without a side head.

The 30, 36 and 46 in. machines range from 40 to 50 hp. The big machines, 56 in. and up, have 75 to 100 hp.

The 46-in. machine illustrated has a ram and turret, side head and coolant pan. *Write*: King Machine Tool Division, American Steel Foundries, 1150-X Tennessee Ave., Cincinnati 29, O. *Phone*: Redwood 9210



Pit Furnaces Supply Temperatures to 1350°F

The Versa-Duty furnace can do nitriding, bright tempering, steam tempering, annealing (bright or special), bluing, nonatmosphere heat treating and many other heat treating operations.

A high speed fan circulates the gases to heat the densest of loads rapidly.

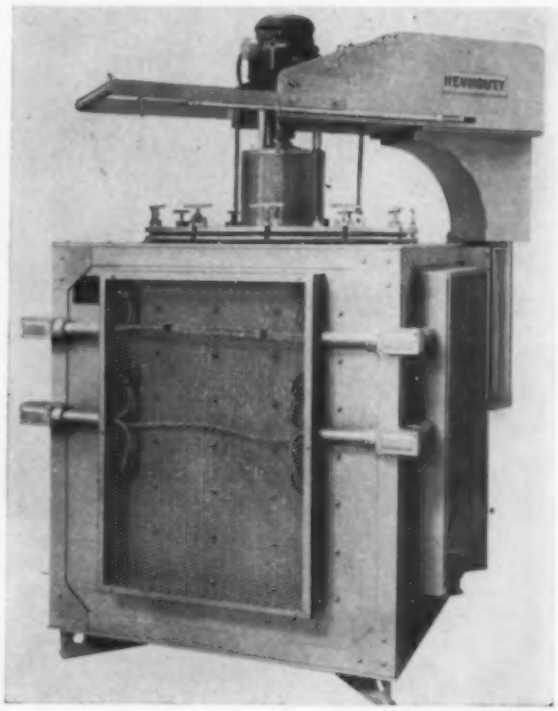
The cover assembly and retort containing the load may be removed from the furnace for slow cooling under atmosphere, and another charged retort can be put immediately into the hot furnace. This speeds production in nitriding and atmosphere annealing and tempering operations.

For nonatmosphere heat treatments, a baffle (to direct the flow of hot gases) may be substituted for the retort while the furnace is hot. A variety of operations then can be done without loss of time and with conservation of heat.

Sectional baskets are used to minimize distortion by reducing the weight on parts at the bottom of the load.

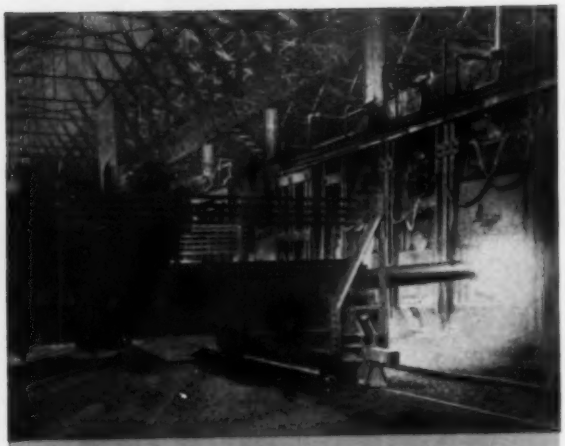
The use of a controlled atmosphere insures that the work is clean and bright after treatment. Sandblasting and cleaning operations are eliminated.

Furnace sizes range from a 16-kw unit with a loading space 12 in. in diameter and 16 in. deep to a 95-kw furnace with a 28 in. diameter and a 48 in. depth. *Write*: Hevi Duty Electric Co., Milwaukee 1, Wis. *Phone*: West 3-2756



CLAYMONT ALLOY STEEL PLATES...

. . . are always uniform . . . always top-quality. That's because *three* important things go into every one of these plates—fine steel . . . carefully selected alloying elements . . . and constant attention to rigid quality controls throughout every stage of production.



When the steel comes from the open hearth, it's free of all harmful impurities. Desirable alloying elements are added by skilled technicians while the steel is in the ladle—by men who've made alloying steel their life's work.

Following alloying, Claymont Alloy Steel ingots are stripped from molds and placed in these modern soaking pits. Uniform heat soaks the entire ingot to the proper temperature for rolling into plate.

Plus

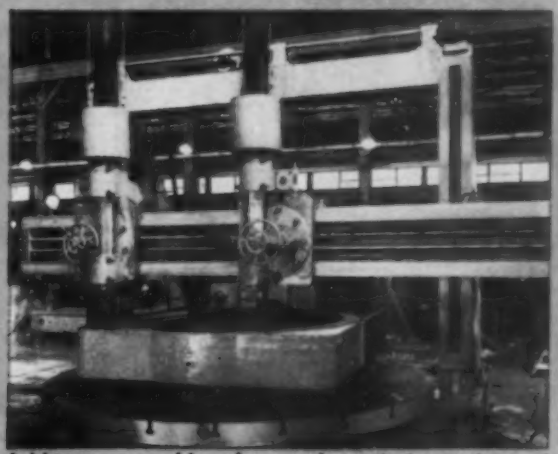
CLAYMONT'S FABRICATION SERVICE...

. . . enables you to take on more jobs than you've ever been able to handle before. For Claymont maintains a 100,000 sq. ft. machine and fabricating shop right in its steel mill. This shop specializes in performing a wide variety of operations for fabricators—rolling . . . pressing . . . drilling . . . boring . . . milling . . . grinding . . . cutting . . . punching . . . welding . . . shearing. As a result, you can in effect supplement your own equipment with Claymont's extensive fabrication facilities. *And* you avoid paying freight and handling charges on that part of your plate that would only become scrap.

Enjoy the advantages of big bending rolls, press brakes and other heavy equipment. Just let Claymont perform some of your heavy-duty operations before your Claymont Alloy Plate ever leaves the mill.

Supplement your burning equipment with Claymont's radiagraphs. You can get steel circle parts . . . without costly scrap losses . . . by letting Claymont's Fabrication service do the job for you.

Save money on many of your welding jobs. Take advantage of this automatic welding machine. With such equipment, Claymont specializes in uniform welding.



Add to your machine shop equipment at no extra cost. For instance, you gain all of the advantages of this modern 16-foot boring mill . . . at a price that'll help you show a tidy profit . . . if you're one of Claymont's Fabrication service customers.

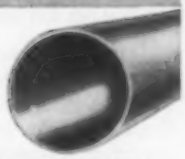
For full details, write Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P. O. Box 1951, Wilmington, Delaware.

OTHER CLAYMONT PRODUCTS

Steel Plates
High Strength Low Alloy
Stainless-Clad · Nickel Plated

Flanged and Dished Heads

Manhole Fittings and Covers



Large Diameter Welded Steel Pipe

CF&I **Claymont Steel Products**

Products of Wickwire Spencer Steel Division · The Colorado Fuel and Iron Corporation

Albuquerque · Amarillo · Atlanta · Billings · Boise · Boston · Buffalo · Butte · Casper · Chicago · Denver · Detroit · El Paso · Ft. Worth
Houston · Lincoln · Los Angeles · New Orleans · New York · Oakland · Odessa · Oklahoma City · Philadelphia · Phoenix · Portland (Ore.)
Pueblo · Salt Lake City · San Francisco · Seattle · Spokane · Tulsa · Wichita
CF&I OFFICES IN CANADA: Montreal · Toronto CANADIAN REPRESENTATIVES AT: Calgary · Edmonton · Vancouver · Winnipeg

4334

NEW PRODUCTS and equipment

Germanium Rectifier

Big and small shops can use this rectifier in electroplating, anodizing and related processing. It comes in self-contained models with ratings of 750, 1500 and 3000 amperes. Voltage range extends from 2 to 12 volts.

A no-fuse, direct current protection system provides positive protection against major external short circuits, continuous overload and internal failure.

Finer positioning and smaller steps of voltage control are provided with a 44-position switch arrangement.

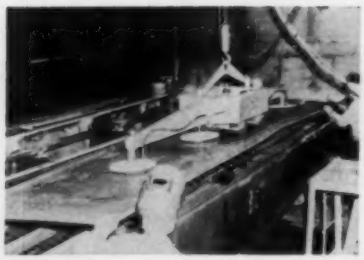
The rectifier gives less than 5 per cent direct current ripple. *Write*: Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J. *Phone*: Matawan 1-1000

Vacuum Lifter

Nonporous materials are lifted and held by the Vac-U-Lift system. It handles materials where size, flexing and surface protection are important considerations. Grease, oil or other protective coatings do not affect its efficiency.

A positive vacuum system creates a vacuum of up to 28 in. of mercury which imparts a positive grip to the pads. A sealing ring attached to the perimeter of the pad controls the sealing action.

A reserve vacuum system maintains positive grip while lifting,



even in the event of power failure.

The system will lift loads up to 16,000 lb. *Write*: Vac-U-Lift Co., Box 298, Salem, Ill.

Sparkproofing

This kit is used on gasoline engines of industrial trucks which are operated where semihazardous fumes or elements are present. It shields the electrical system to eliminate the possibility of sparks reaching inflammable fumes.

The kit consists of an enclosed and shielded distributor, a shielded ignition coil and sealed cables which enclose all high voltage ignition wires. Protective shields are added to the generator at the factory when the kit is installed. *Write*: Lamson Mobilift Corp., Syracuse 1, N. Y. *Phone*: 73-0221

Floor Patching

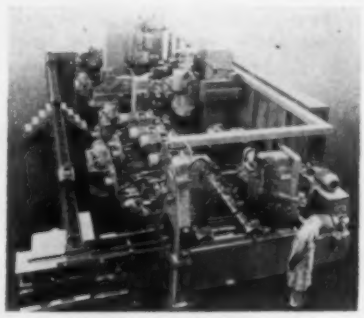
Jiffy Floor repairs expansion joints, floor cracks and other surface defects. It fills hairline cracks, shallow holes and spalled floors without disrupting traffic or production.

The ready-to-use plastic product

withstands heavy loads immediately after application. It will not crack, crumble or curl and can be applied indoors or out. Temperature changes do not affect it. *Write*: Monroe Co. Inc., 10703 Quebec, Cleveland 6, O. *Phone*: Sweetbriar 1-9555

Transfer Machine

This 26-station machine mills, hollow mills, drills, spotfaces, taps and reams 146 forged steering knuckles an hour. Two parts are clamped in pallet - type fixtures and are moved through the machining stations by a transfer mechanism.



Pallets are returned to the first machining operation by a motorized conveyor through a wash and blow-off operation. Clamping and unclamping are speeded by an automatic fixture.

All machine operations on the in-line machine are performed by units that have individual bases and control panels. This simplifies maintenance and provides flexibility for part design changes. *Write*: Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich. *Phone*: Lorain 7-0123

Gear Deburrer

The single-station model BMHP-15 deburrs and chamfers hypoid pinions with 8 to 15 teeth at production rates of up to 280 an hour. Shafts can be up to 15 in. long; outside diameters must be between 3¼ and 8 in.

The pushbutton controlled, automatic cycle makes it possible for one operator to handle two machines.

The unit deburrs and chamfers the acute angle profile and part of the root at the toe and heel end of each tooth. When required, it

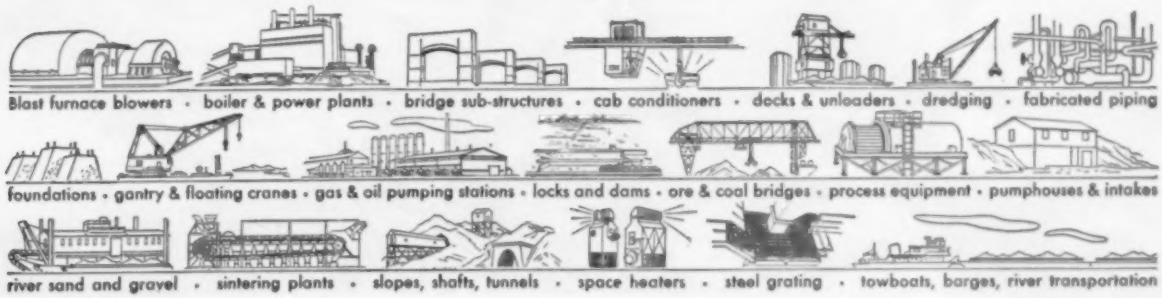
DRAVO heaters save $11,000 annually— pay for themselves in 3 years

A cost study of heating systems at the Zanesville, Ohio, plant of Detroit Harvester Company indicated that Dravo forced air heaters would save $11,000 annually in fuel costs. At this rate, the heaters would pay for themselves in three years, also eliminate a major expenditure to extend and revamp an outgrown steam boiler system.

The original estimate of fuel savings was verified in the first year after installation of Dravo heaters; maintenance costs were down; and uniform temperatures maintained.

Dravo heaters provide economical heating for thousands of industrial buildings, warehouses, schools and office buildings. For information on how they can fit into your plans, or on any of the other Dravo products and services listed below, write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO
CORPORATION


Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping
foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes
river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

NEW PRODUCTS and equipment

produces a peripheral chamfer on the large end.

Depth of cut is adjustable. Automatic indexing of the pinion from tooth to tooth takes place during the return stroke of the tools. There are three cutting strokes a second.

Parts are ejected by pressing a foot pedal. *Write*: Modern Industrial Engineering Co., 14230 Birwood Ave., Detroit 38, Mich. *Phone*: Webster 3-7280

Welding Electrode

No. 8-60 is a 55 to 60 per cent nickel alloy electrode that makes machinable deposits on cast iron. It is recommended for high phosphorous irons, heavy sections and work requiring high strength in the weld area. Typical applications: Repair of cylinder heads and blocks, machine bases and equipment parts.

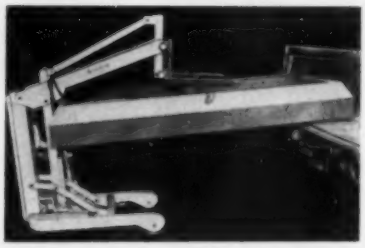
The electrode is said to have higher strength and better elongation than 99 per cent nickel rods. Test specimens have shown up to 60,000 psi tensile and 8 per cent elongation.

The electrode can be deposited with alternating or direct current reverse polarity and at amperages of 40 to 180. Preheating is not needed.

Available sizes: 3/32, ⅛, 5/32 and 3/16. *Write*: All-State Welding Alloys Co. Inc., 249-55 Ferris Ave., White Plains, N. Y. *Phone*: White Plains 8-4646

Fork Truck

The Hydrauliphant can work on elevators, upper floors and light truck beds because it weighs less than 3000 lb.



The crane type load arms can reach up 108 in. It deposits loads well back in truck beds.

Long stock can be carried down narrow aisles parallel to the aisle. *Write*: Autoquip Corp., 1140 S. Washtenaw, Chicago 12, Ill. *Phone*: Van Buren 6-5353

NEW literature

Write directly to the company for a copy

Stainless Steel

Bulletin P.O. 2856, 4 pages, describes standard and special grades of stainless bars and wire. Product Information Service, Armco Steel Corp., Middletown, O.

Magnetic Shielding

Steels that are nonshock sensitive and nonretentive are covered in bulletin 101 (1957), 33 pages. Magnetic Shield Division, Perfection Mica Co., 20 N. Wacker Dr., Chicago 6, Ill.

Grinding Wheel Adapters

This 8-page bulletin presents a line of grinding wheel adapters and toolroom and grinding room accessories. Wm. Sopko & Sons Co., 140 E. 267th St., Euclid 32, O.

Gear Shaving Cutters

Bulletin CR.56-10, 12 pages, lists data on speeds, feeds, coolants, cutter life, sharpening, storage and cutter repair procedures. National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.

Power Ventilators

Engineering data on five series of roof and side wall ventilators are given in catalog C-5-B. Carnes Corp., Verona, Wis.

Melting Furnaces

Bulletin R-42 describes the use of line frequency induction furnaces in zinc and aluminum diecasting plants. Ajax Engineering Corp., Lalor & Hancock St., Trenton 7, N. J.

Industrial Clutches

Air operated single and double disc clutches are described in bulletin 5011, 2 pages. Industrial Clutch Corp., Waukesha, Wis.

Special Fasteners

Over 100 special fasteners and their descriptions are included in this 16-page bulletin. Buffalo Bolt Co., Oliver St., North Tonawanda, N. Y.

Switches

Bulletin 77, 24 pages, describes enclosed switches for air-borne equipment. Heavy duty precision switches for machine tools and other equipment are covered in bulletin 84-222, 8 pages. Micro Switch Division, Minneapolis-Honeywell Regulator Co., Freeport, Ill.

Pressure Pipe

Bulletin 152-A, 4 pages, describes steel pipe, tubing and welding fittings made of a chromium-molybdenum alloy steel with good creep-strength properties. Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa.

Positioning Controls

Bulletin J-100, 8 pages, describes electrical remote positioning controls for pushbutton and automatic operation. Jordan Co. Inc., 3235 W. Hampton Ave., Milwaukee 9, Wis.

High Temperature Insulation

This 6-page bulletin lists comparative data on 14 types of fibrous insulation. H. I. Thompson Fiber Glass Co., 1733 Cordova St., Los Angeles 7, Calif.

Drill Bushings

This 12-page bulletin contains installation procedure and engineering data on bushings for drill sizes from No. 55 to ½-in. Penn Engineering & Mfg. Co., Doylestown, Pa.

Belting Catalog

Descriptions of stitched canvas belting for conveyors, elevators and power transmission and data on belt

FOR CUSTOMIZED CONVEYORS
WITH MAY-FRAN STANDARDIZATION

Developed to provide the ultimate of versatility, the May-Fran program of STANDARDIZATION permits users to create and construct their own conveyors to meet individual needs.

It literally provides a type of "super market" shopping for the straight, curved, inclined, take-up and discharge end sections required to meet the specifications of YOUR job requirements. Sections can be furnished to meet belt width as well as load bearing and volume capacities. Conveyors can be changed relative to length or width with only a minimum of downtime.

Write today . . . ask for a copy of MF Bulletin No. 200

MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Rd. • Cleveland 12, Ohio

When you need 52100 steel bars and tubes go direct to Peterson....world's largest stocks. NOTE: For better machineability specify *leaded* bars.

52100

ONE WAY

PETERSON

STEELS, INC.

Union, New Jersey • Detroit, Michigan • Chicago, Illinois

NEW LITERATURE

tension, safe working loads, pulley diameters and maintenance are given in this engineering handbook. Imperial Belting Co., 1750 S. Kilbourn Ave., Chicago 23, Ill.

Stampings

Design information on stampings and deep drawings is included in this 6-page bulletin. Stanley Pressed Metal Division, Stanley Works, 195 Lake St., New Britain, Conn.

Marking Tools

A billet marker, tag embossing and tagging outfit, billet mill cut letter stamps, steel stamps and type, and type holders—all for use in steel plants are described in bulletin ST-110. M. E. Cunningham Co., 1038 Chateau St., Pittsburgh 33, Pa.

Fabrication

Advantages of steel plate weldments are described in this 20-page bulletin. Acme Welding Division, United Tool & Die Co., 1054 New Britain Ave., West Hartford, Conn.

Powdered Metals

This 12-page bulletin describes advantages and case histories of parts made of powdered metals and tells how to perform machining and welding operations on them. Powdered Metal Parts Division, Lux Clock Mfg. Co., 100 Johnson St., Waterbury, Conn.

Sling Catalog

Wire rope slings and assemblies are presented in a way to speed selection in catalog A-931, 51 pages. John A. Roebling's Sons Corp., Trenton 2, N. J.

Processing Equipment

This 32-page bulletin aids in the cost estimation and selection of impervious graphite heat exchangers, cascade coolers, HCl absorbers, towers, centrifugal pumps, rupture discs, pipe, fittings and valves. Falls Industries Inc., Aurora Rd., Solon, O.

Carbide Blanks

Bulletin GT-314, 35 pages, lists prices of cemented carbide blanks and solid cemented carbide cylinders. Metallurgical Products Department, General Electric Co., Detroit 32, Mich.

Lubricators

This 2-page bulletin describes push-type semiautomatic lubricators for machines requiring closely controlled but infrequent oil feed. Service, Bijur Lubricating Corp., 151 W. Passaic St., Rochelle Park, N. J.

MEMO TO: *You*

YOU MIGHT AS WELL try to count the beans in a carload as the number of parts that are made of Roebling High Carbon Specialties, Flat Wire and Spring Steel. These Roebling products are unsurpassed for mechanical and dimensional uniformity . . . for speeding manufacturers' production and cutting costs.

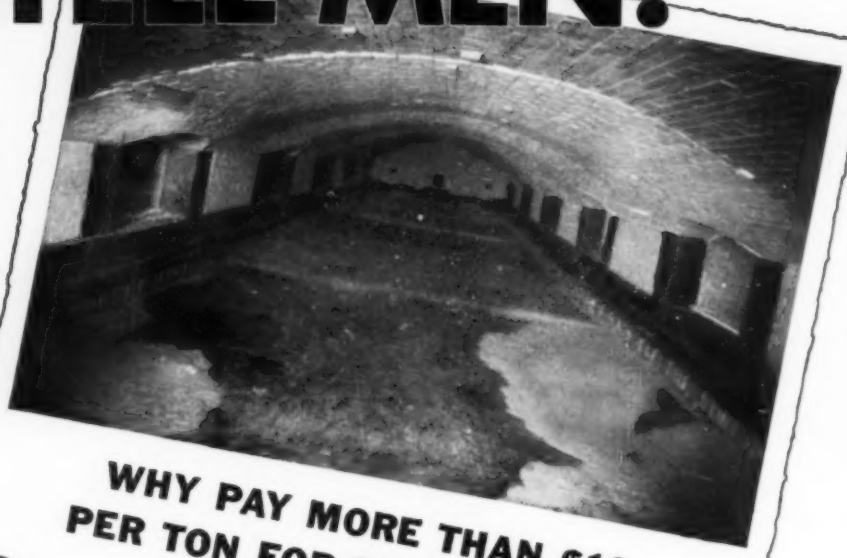
Next time you order cold rolled high carbon wire or spring steel specify Roebling. Strictly on its performance you'll probably become a steady customer from then on. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING CF

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N.Y.

STEEL MEN!



WHY PAY MORE THAN $12 PER TON FOR FLUX BLOCKS?

ORIGINALLY, glass tanks were built of small, fire-clay brick or sandstone blocks. No. 1 fire-brick of this type can be bought for $12 per ton. Clay flux blocks of essentially the same materials cost $60 per ton. Why pay a 500% premium simply to get *bigger pieces* of the same material?

Your reply, of course, is that the larger pieces improve furnace life by 40% to 50%—that you are willing to pay 500% more for your blocks, to get 50% greater life for your tanks. And that is true of every glass-tank owner in America today. Since you are already paying a 500% premium for a 50% return, *why is it not logical for you to buy Corhart Electrocast, at a smaller price premium over clay,* AND GET OVER 200% INCREASE IN FURNACE LIFE?

If you are looking for economy in the purchase of your tank blocks, you need pay only $12 per ton. On the other hand, if you want the lowest cost per day of tank life, or the lowest cost per ton of glass produced, you can not stop at the $12 block *or at the $60 block.*

Corhart Electrocast is the world's highest-priced refractory per ton of blocks, and the lowest-cost refractory per ton of glass produced . . . May we *prove* it to you? Write for definite facts. *Address:* Corhart Refractories Co., *Incorporated,* 16th and Lee Sts., Louisville, Ky.

CORHART ELECTROCAST REFRACTORIES

IN June, 1933, when this old ad appeared, Corhart Electrocast was still new in the glass industry. Only a few glass companies dared then to buy it, "one of the world's highest-priced refractories". But today its use is practically universal . . .

Now Corhart 104 is still new in the steel industry — but despite its high price, it offers steel furnace operators the same opportunities for greater production and lower costs that Corhart Electrocast brought to glass.

May we send you complete data? Address: Corhart Refractories Co., Incorporated, 1616 West Lee Street, Louisville, Kentucky, U.S.A., SPring 8-4471.

QUALITY ECONOMY ENDURANCE

CORHART 104 ELECTROCAST REFRACTORY

The words "Corhart" and "Electrocast" are registered Trade Marks which indicate manufacture by Corhart Refractories Company, *Incorporated.* Corhart Refractories Co., *Incorporated,* 1600 West Lee Street, Louisville 10, Kentucky, U.S.A.—Telephone SPring 8-4471.

Market Outlook

STEEL SELLERS will be knocking on more and more doors. They have more steel to offer. The reasons: Demand is a little softer, and steel production capacity is a little larger.

But this happier situation for buyers won't extend to everyone. Users of plates, structural shapes, oil country tubular goods and large line pipe won't notice much, if any, improvement.

BUYER IS BOSS—Steel users are gearing purchases to consumption. (One automobile stamping plant in Ohio is reported to be holding its inventories down to the steel in transit to it.) There is reduced incentive to buy for inventories. Supply shortages in many forms of steel no longer are a worry to the buyers. Mills have increased their capacities, and the three-year labor contract in the steel industry promises uninterrupted production this year.

MODERATION—Consumers built inventories in the last three months of 1956, but the rate of addition was modest. In October, latest month for which figures are available, they stored away 7.5 per cent of the steel shipped to them.

Moderation in building inventories augurs well for the year. It precludes an inventory reduction—and its companion, a slump in steel mill operations.

LOWER SIGHTS—Although ingot production is near capacity (98.5 per cent of capacity in the week ended Jan. 20), the year's average is unlikely to be nearly that high. There's speculation that 1957 ingot production may fall short of the 120 million tons predicted earlier. A 120-million-ton figure would be about 90 per cent of capacity. This means 10 per cent, perhaps more, capacity would be idle.

In most of the last 15 years, idle capacity has been unusual, but prior to that it was common. In the 22 years between World Wars I and II, 12 per cent or more of the capacity was always idle. Nevertheless, steel capacity rose 38 per cent in that period.

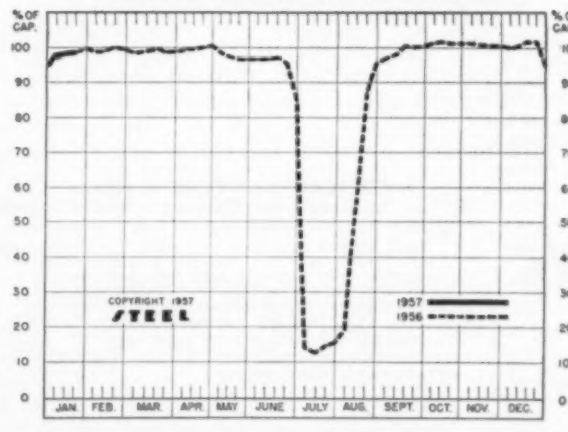
RECORD SPENDING—Steelmaking capacity will continue to rise. The iron and steel industry expects to spend a record $1.7 billion this year for equipment and construction. Last year, it spent $1.2 billion.

Some idle capacity is not calamitous for the steel industry. It can operate more efficiently when it doesn't have to push equipment to the limit. Some of the capacity is old equipment kept only for stand-by purposes. Take it out and there would be less idle capacity. One small plant is doing just that. It is doing away with open hearths now that it has electric furnaces.

MEN AT THE DOORS—New England is one place where steel salesmen are knocking on doors. Most producers who withdrew from that area on carbon steel sheet sales during the period of heavy demand are back with allotments and are equalizing freight with the nearest mill, the Fairless Works of U.S. Steel Corp.

In contrast, production of large diameter line pipe is booked up into mid-1960 (see page 105). A leading producer of oil country tubular goods expects its operations to continue at capacity for the next two years. The fabricated structural steel industry had larger bookings on Dec. 1 than at the start of any other month in 1956. Its backlogs were 3,252,202 tons. That's equal to three months' production of all plate and structural mills in this country.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Jan. 20	Change	Same Week 1956	Same Week 1955
Pittsburgh	99	— 1*	102	80
Chicago	98.5	+ 0.5*	99	86
Mid-Atlantic	100	— 2	97	77
Youngstown	100	— 2	100	88
Wheeling	98	— 0.5	97.5	95.5
Cleveland	93.5	+ 1*	102	87
Buffalo	107.5	0	105	100
Birmingham	97.5	+ 3	96.5	74
New England	72	— 1	94	78
Cincinnati	97	— 2.5	88	81.5
St. Louis	100.5	+ 5	99	87.5
Detroit	103.5	+ 2	104	89
Western	101	— 1	106	84
National Rate	98.5	0	98.5	83

INGOT PRODUCTION‡

	Week Ended Jan. 20	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	156.7†	156.8	157.2	151.7
NET TONS (In thousands)	2,517†	2,519	2,525	2,437

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

"SWITCH!" said Ostuco

. . . and savings were surprising!

Pleasant surprise, too! Bearings Company of America, Division of Federal-Mogul-Bower Bearings, Inc. Lancaster, Pa., was machining OSTUCO seamless tubing to make a clutch release bearing collar used as original and replacement equipment. Results were fine!

Then word came from OSTUCO, recommending a switch to OSTUCO's newly developed NP-60, tubing specially processed for machineability. Cost was slightly higher, but BCA and OSTUCO engineers predicted the savings would justify the change.

they switched . . .

and they SAVED!

	Regular	Specially Processed NP-60
Production per 8 hour shift (units)	675	840
Production time per 1000 units (hours) . . .	12.35	10.03
Total Labor per 1000 units (man-hours) . .	13.09	10.63

Besides the savings, Bearings Company of America was pleased with the better finish of the new part. They point out that the collar in photo above "shows the finish as it comes directly off the machine."

It happens this way often enough to warrant checking with OSTUCO about your tubing applications and production problems. Contact your nearest OSTUCO Sales Engineer or write direct to the Shelby factory —there's no obligation!

OSTUCO TUBING

SEAMLESS AND ELECTRIC RESISTANCE WELDED STEEL TUBING—Fabricating and Forging

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company • **SHELBY, OHIO**
Birthplace of the Seamless Steel Tube Industry in America

SALES OFFICES: BIRMINGHAM • CHARLOTTE • CHICAGO (Oak Park) CLEVELAND • DAYTON • DENVER • DETROIT (Ferndale) HOUSTON • LOS ANGELES (Beverly Hills) • MOLINE NEW YORK • NORTH KANSAS CITY • PHILADELPHIA PITTSBURGH • RICHMOND • ROCHESTER • ST. LOUIS ST. PAUL • SALT LAKE CITY • SEATTLE • TULSA • WICHITA

CANADA, RAILWAY & POWER ENGR. CORP., LTD.

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY 225 Broadway, New York 7, New York

Republic Steel Corp.

Large diameter pipe will roll out by the trainload, because . . .

Big Pipe Is Booked Into '60

LARGE DIAMETER steel line pipe production is booked up to mid-1960. This is farther than any other steel mill product.

Even plates and structurals, both in heavy demand, are not booked up that far, although they would run well into the future if producers would accept orders for more than a quarter or two.

Long Range Projects—The nature of pipeline projects makes it impractical to take bookings for only a quarter at a time. When a pipeline is planned, the amount of pipe needed can be accurately determined. No less than that amount would suffice. There has to be enough to reach from beginning to end. So, when pipeline builders place an order, it's for an entire project. Because of the growth in the oil and gas industries, there are many pipeline projects.

Most of the orders for the large diameter (24 in. or more) line pipe are for the transmission of gas, either to new areas or for paralleling present lines so that more gas can be delivered to places already being served. One of the new areas is Florida. The Federal Power Commission has approved a $150 million line from Texas to Florida to supply natural gas to most of the Sunshine state. Pensacola and Tallahassee are the only Florida areas now getting natural gas.

Big Growth—Total use of natural gas in the U.S. is about five times that of 1939. Homes consume around five times as much gas and industries and commercial establishments use about four times as much as they did in 1939. Industrial and commercial uses continue in the lead; they take twice as much as homes do.

Production of natural gas and oil in the U.S. set records in 1956. The preceding year had been a record one, too, for gas and oil. The U.S., with about 7 per cent of the world's population, uses nearly as much oil as the rest of the world.

Short of Skelp—Large diameter line pipe mills would not be booked up into 1960 if plate demand weren't as strong as it is. Skelp (the plate-like material from which large diameter line pipe is made) comes from the plate mills. One producer of large diameter line pipe is running only two shifts instead of three a day because of the lack of skelp.

Line pipe backlogs would shorten by perhaps a year if all of the skelp needed would be available. There is little likelihood of this in view of the vast amount of construction under way and projected and the shipbuilding program to expand our tanker fleet. Construction and shipbuilding are big users of plates.

Bigger than Big Inch—Large diameter line pipe comes from about seven mills in this country. Much of these mills' output is a bigger product than the Big Inch line of World War II fame. That line's pipe is 24 in. in diameter. Mills think nothing of turning out 30 in. and 36 in. diameter pipe today.

Another thing mills do to pro-

vide jumbo size pipe is to weld two lengths together before shipment. Republic Steel Corp.'s mill at Gadsden, Ala., had an order for 30 in. diameter pipe for use in fairly level land where long lengths could be handled easily. Longest length that can be produced in the mill is 30 ft. Outside the mill, two 30 ft. lengths are butted together and welded to make 60 ft. sections. Use of 60 ft. lengths cuts the amount of field welding in half.

Tubular Goods . . .

Tubular Goods Prices, Page 121

A leading producer of oil country tubular goods expects its operations to continue at capacity for the next two years, basing its plans on projected demands of the oil and gas industries.

One Pittsburgh tubemaker thinks oil country tubular goods capacity will have to be increased from 25 to 30 per cent in the next seven years. Much of this increase will be necessitated by the steady rise in demand for high alloy tubing.

Second quarter order books will be opened at the end of this month and the mills expect to be swamped with specifications.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 116 & 117

There is growing apprehension that the automobile builders are not going to take their full quotas of sheets in the first quarter. This applies particularly to cold-rolled sheets and strip, but lagging demand also is showing up in hot rolled. Galvanized sheets are seasonally sluggish.

Although auto assemblies are rising, it is thought steel is not being consumed as fast as it is received. Even for hot-rolled sheets, the auto makers are not pressing for tonnage. Car sales have not spurted as expected.

Until now, sheetmakers have had customers waiting to take any additional steel that might be offered them, but fewer customers are showing interest in excess tonnage. Appliance makers are in pretty much the same position as the auto builders. Their steel supply is described as comfortable, and they are making future commitments cautiously.

While sheetmakers are disappointed in current volume, over-all consumption continues relatively heavy. Bookings vary among the mills, Granite City Steel Co., Granite City, Ill., for example, reporting a full order book in cold-rolled sheets for first quarter, with some carry-over likely. Consumption of hot-rolled sheets is heavy and cold-rolled consumption is moderate. The belief is that auto needs will spurt during last half of this quarter despite lagging interest in certain of the new model cars.

One leading sheetmaker is confident its hot mills will operate at capacity throughout this quarter, reasoning that in addition to direct demands from the consuming trade, tin plate requirements will continue at a fast pace, and cold-rolled specifications will show no further easing.

Sheet mill operations are at high level. Some producers are turning to the production of light plates. Some mills that had withdrawn

7327-HC

PROTECT YOUR INVESTMENT WITH A Harco CATHODIC PROTECTION SYSTEM

Corrosion has an expensive appetite

If you can afford the bill . . . enjoy your guest. But remember . . . you've got this guest whether you can afford her or not. Check your profits . . . and see what this appetite is costing you regularly.

Electrolytic corrosion is the biggest single destroyer of buried or submerged metal structures and pipelines.

IT CAN BE STOPPED. That's where HARCO comes into the picture. It's our business to protect your investment. We are the specialists who can prevent and cure electrolytic corrosion . . . QUICKLY AND ECONOMICALLY. It is a fact . . . most cathodic protection systems pay for themselves in a matter of months . . . just through savings in normal maintenance and replacement costs.

HARCO regularly supplies a complete range of services. Whatever your needs . . . engineered systems, contract installations or materials . . . LOOK TO HARCO . . . FIRST IN THE FIELD OF CATHODIC PROTECTION!

Write today for catalog or call MOntrose 2-2080.

Harco

CATHODIC PROTECTION DIVISION

THE HARCO CORPORATION

16981 Broadway • Cleveland, Ohio

from the New England market during the period of tight supply are back in the area with allotments, equalizing prices with the nearest producing mill.

The trend of prices is upward. Kaiser Steel Corp., Oakland, Calif., raised base prices $1 a ton on hot-rolled sheets and strip, and cold-rolled sheets, while upping its price on cold-rolled strip $2. These increases, made to offset increased costs including higher freights, became effective Jan. 11.

Granite City Steel Co. last week revised its extra list on hot and cold-rolled sheets similar to changes effected recently by other makers.

Republic Steel Corp., Cleveland, has issued a revised list of extras on Toncan iron enameling sheets dated Jan. 10 in which changes are effected in gage and length extras. The new list replaces one dated Dec. 29, 1955.

Also, Republic has issued a revised extra card for hot-rolled carbon steel strip, effective Jan. 11. The changes, similar to those announced by other makers recently, affect extras for size, cutting, and chemical requirements. Increases range from 5 to 20 cents per 100 pounds. The revised card replaces one dated Feb. 1, 1956.

Steel Bars . . .

Bar Prices, Page 115

Except for large rounds and flats, hot-rolled carbon bars are in comfortable supply. In fact, warehouses and cold-finishers say they are having difficulty keeping the mills from shipping them more than their current allocations.

Most buyers' stocks are in better shape than they have been in many months. Until recently the warehouses, as a consumer classification, have been the most active takers over recent weeks, building up rounded inventories. This may mean a slackening in jobber demand in second quarter.

Cold-drawn bars, and hot and cold-drawn alloy bars are moving slowly. The outlook in cold-drawn is for dull demand from auto builders and appliance makers this quarter.

The farm equipment industry is doing better. But this does not mean a lot more steel will be bought for consumption. Only about 1.5 per cent of all finished steel shipped in 1956 went to the agriculture classification. A number of farm implement companies are recalling furloughed workers.

Tin Plate . . .

Tin Plate Prices, Page 117

Kaiser Steel Corp. will shortly begin shipment of tin plate in coils to several large customers. This is in line with the trend away from cut sheets as canmakers press for lower costs (See STEEL, Nov. 19, 1956, page 211).

Use of tin plate increased markedly along the Pacific Coast in 1956, due largely to tremendous tomato and pea crops.

Wire . . .

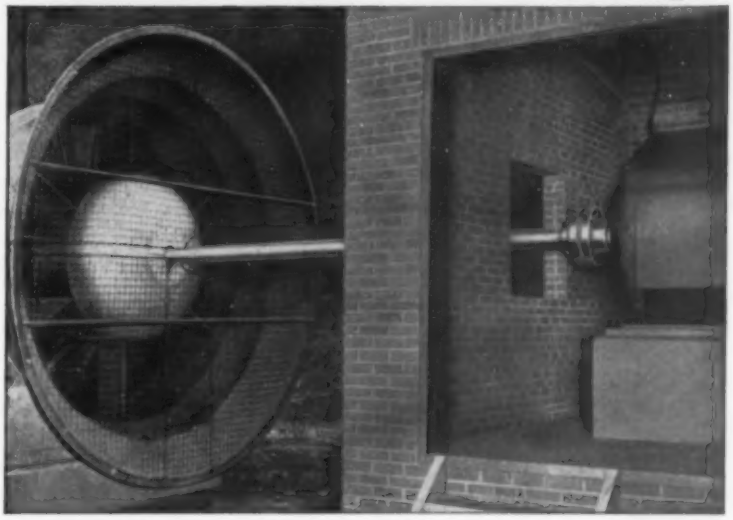
Wire Prices, Pages 117 & 118

The slack in buying of finished wire goods is reflected in slower demand for rods. Of February allotments, less than 70 per cent has been sold compared, with about 80 per cent in January. This decline is heaviest in semifinished for specialties in New England.

Heading, spring and manufacturers wire buying continues light and spotty. Automotive demand blows hot and cold. In general, it appears to be only slightly improved.

Orders for highway accessories,

Eliminate Intermediate Bearings!



By using Thomas Flexible Couplings on long, unsupported shafts, intermediate bearings are eliminated. Thomas engineers tubular shafts free from lateral whip.

The large fan shown above is 16' from the motor to allow sufficient air intake. Miners working underground receive their fresh air supply from this fan and others like it, which have been giving dependable service for as long as fifteen years . . . without shutdowns for lubrication or maintenance of the couplings.

Thomas floating shaft flexible couplings are recommended for machine and marine drives, printing presses, paper and cement mills, cooling towers, diesel engines, pumps, compressors, and many other uses.

Only Thomas Flexible Couplings offer *all* these advantages
UNDER LOAD and MISALIGNMENT

1. Freedom from Backlash—Torsional Rigidity
2. Free End Float
3. Smooth Continuous Drive with Constant Rotational Velocity
4. Visual Inspection in Operation
5. Original Balance for Life

. . . and

THOMAS ALL METAL COUPLINGS HAVE NO WEARING PARTS SO LUBRICATION AND MAINTENANCE ARE ELIMINATED

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

mesh and strand, are heavy, but shipments are held up usually until March or later, pointing to probable overloading of this class of tonnage late this quarter.

Warehouse . . .

Warehouse Prices, Page 122

Some warehouses are not taking all the steel offered them by the mills. Distributors are becoming more selective and a bit wary lest stocks of certain products (cold-rolled and galvanized sheets, small carbon bars and wire products) become too large.

The only products which continue in short supply are plates, shapes and nickel-bearing grades of stainless steel. Distributors can sell as large a tonnage of these products as they are able to obtain.

After a slow December, accelerated sales campaigns resulted in improvements in January shipments to fabricators.

Warehouses are revising price schedules to include increases posted by mills and to cover increased freight rates. Higher mill extras already are in effect.

Tool Steel . . .

Tool Steel Prices, Page 121

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 9889 net tons in November, reports the American Iron & Steel Institute. This was down 901 tons from the 10,790 tons moved in October, and was off 726 tons from the 10,615 tons shipped in November, 1955.

Total tonnage moved in the first 11 months of the year was 117,194 net tons. This was up 13,442 tons from shipments of 103,752 tons in the first 11 months of 1955.

Alloy Steel . . .

Higher prices are being effected on various alloy steel items. In some cases base prices are being raised; in others, higher extras are being applied. While only a few companies have taken action so far, expectations are that the other makers will follow.

Allegheny Ludlum Steel Corp., Pittsburgh, increased the base price of special high nickel electrical alloys 6 to 11 cents a pound on grades containing 42 to 79 per cent nickel in plates, sheets and cold-rolled strip; and from 8.5 cents to 15.5 cents a pound on grades containing from 42 to 79 per cent nickel on bars and cold-finished wire ½-in. and under. No. changes were made in extras on bars, sheets, plate, wire and rod.

Effective Jan. 12, Youngstown Sheet & Tube Co., Youngstown, O., increased alloy grade extras on molybdenum and vandium bearing steels applicable to hot-rolled alloy steel bars, sheets, strip, plates and semifinished steel. The increases are small.

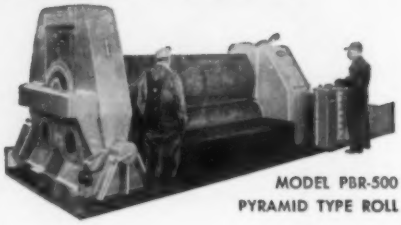
Recently, Crucible Steel Co. of America, Pittsburgh, increased base prices on high-temperature and high nickel steels from ½ cent to 12.5 cents a pound, effective Jan. 7.

In December, Republic Steel Corp., Cleveland, put into effect a revised classification of extras on hot-rolled alloy and special steels, blooms, billets, slabs, bars and

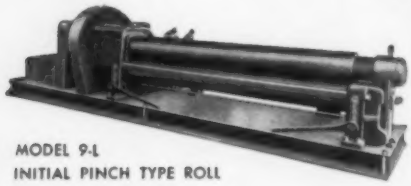
WEBB PLATE FABRICATING MACHINERY

PLATE BENDING ROLLS

The Webb Corporation offers a complete line of Plate Bending Rolls for the rolling of the thinnest plate up to plate 2½" thick. Offered in a variety of lengths and thicknesses. Constructed for the modern fabricating shop.



MODEL PBR-500
PYRAMID TYPE ROLL



MODEL 9-L
INITIAL PINCH TYPE ROLL

Two types available: the Initial Pinch Type and Pyramid Type machines. All latest advantages of today's modern machine tools are incorporated, utilizing anti-friction bearings, totally enclosed gear drives. Special forming rolls for culvert pipe, stock tanks and other special shapes available.

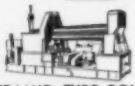
SLIP ROLLS

A complete line of small Sheet Metal Forming Rolls are also available. All power-driven with shaft sizes 3" to 5" for the handling of the thinnest gauge material, up to 8 gauge material. Special rolls for the forming of polished sheets, aluminum and stainless steels can be furnished. Complete catalogues on any size machine furnished upon request; write Dept. D.

SLIP ROLLS
UP TO 8 GAUGE PLATE

Let Speed PAY—The WEBB Way!

SLIP ROLLS



PYRAMID TYPE ROLL

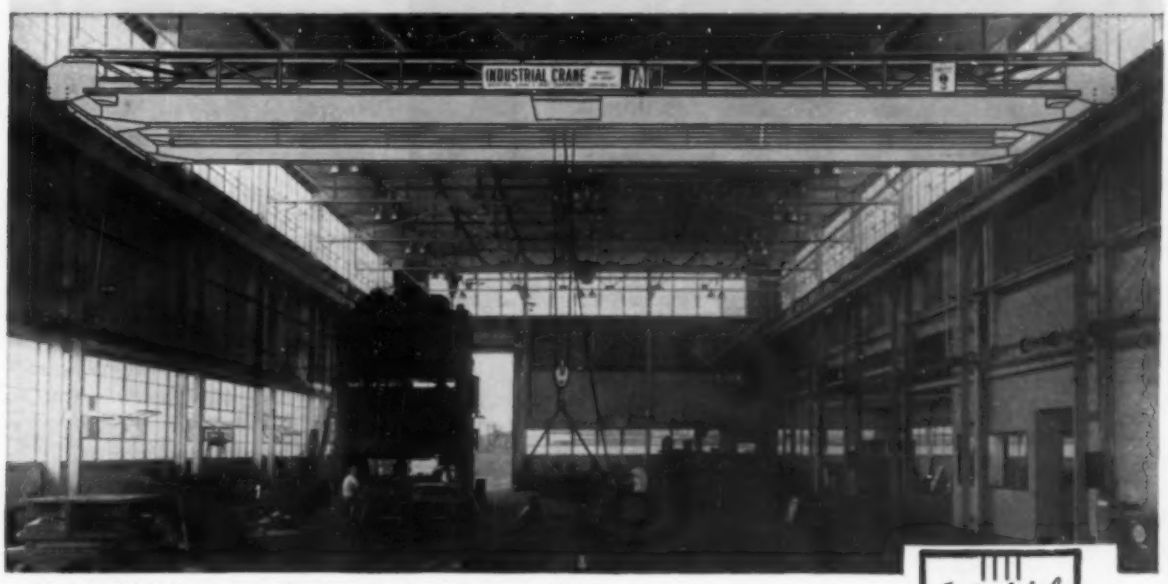
INITIAL TYPE ROLL

STEELWORKERS

Also Manufacturers of INDUSTRIAL WEIGHING EQUIPMENT

Since 1881 THE WEBB® CORP.
WEBB CITY, MO., U. S. A.

Industrial top-running MOTOR DRIVEN CRANES are Better Values



The Industrial 7½ ton crane in photo is equipped with 5 step variable speed push button control to facilitate delicate handling of expensive dies.

Industrial CRANES

INGERSOLL B-W BORG-WARNER

The high quality built into Industrial Cranes means more production and less down time to the user. A glance at a few of the outstanding features will show you the better value that is built into every Industrial Motor driven crane. The best crane for the long run.

- **Rolled Forged Steel, heat treated wheels.***
- **Long-life, precision ball and roller bearings throughout.**
- **All welded, precision jig-bored end trucks for true smooth operation.**
- **Two large size gusset plates at each end-truck assuring permanent squareness.**
- **Rugged type outrigger for additional lateral strength.**
- **Special push button control for efficient operation from floor or cab control.**
- **All Industrial cranes including underhung types designed for easy erection at job site.**

*Standard on heavy duty models

Consult with Industrial Crane & Hoist for assistance in solving your Materials Handling Problems

Industrial Motor Driven Cranes are designed for all types of service, in light, regular, and heavy duty models

TR 955C

INDUSTRIAL CRANE & HOIST

Ingersoll PRODUCTS DIVISION

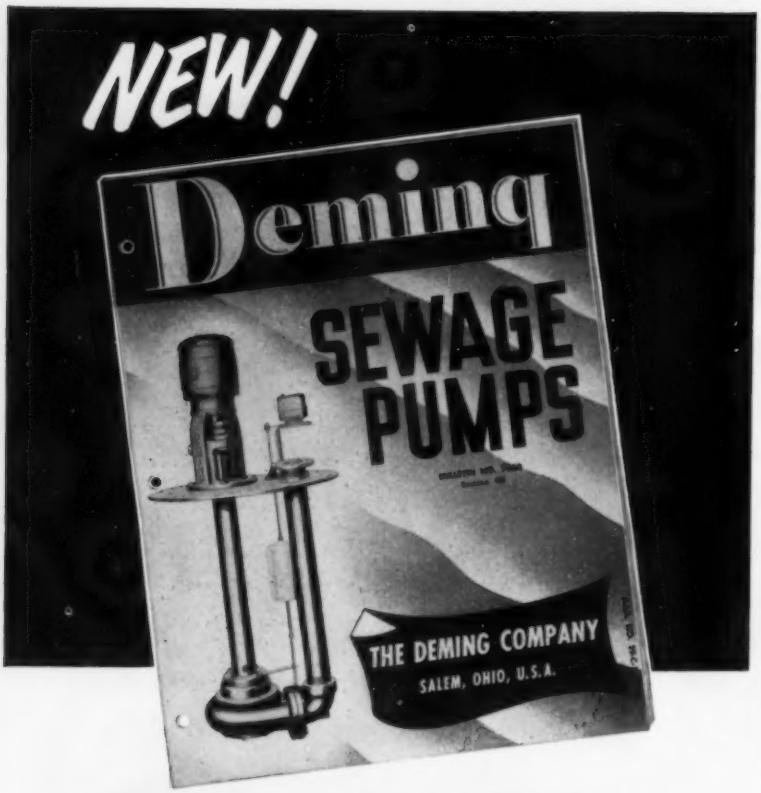
BORG-WARNER CORPORATION

GENERAL OFFICES

1536 SOUTH PAULINA STREET CHICAGO 8, ILLINOIS

DISTRICT OFFICES: NEWARK · DETROIT · BIRMINGHAM

EXPORT SALES: BORG-WARNER INTERNATIONAL, 36 SOUTH WABASH AVE., CHICAGO, ILLINOIS



Standardized Line

FOR WET AND DRY PITS

Check this new standardized line of Deming Sewage Pumps. BULLETIN 7500 shows their modern features and explains their advantages.

Heavy duty construction, close tolerance dowelring fittings from motor base through to pump casing, and positive alignment of all rotating and guide-bearing parts assure smooth, dependable operation and a minimum of maintenance.

And note this: Obsolescence factors reduced to a minimum!

Sizes range from 2½ to 4-inch discharge. Pumps handle solids from 1½ to 3 inches in size. Single and Duplex units available for wet and dry pit installations. Capacities range to 900 g.p.m. and heads to 110 feet. Units can be furnished with various types of drives up to 20 H.P.

AND NOTE THIS:

Quick deliveries assured. Repair parts available for prompt shipment.

Send for Bulletin 7500 NOW!

THE DEMING COMPANY, 535 Broadway, Salem, Ohio

Pump it with STANDARD

DEMING PUMPS

and roll up SAVINGS!

spring sizes. This new list became effective as of Dec. 21.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 115

While winter weather has slowed down building operations, demand for building bars is holding up better than usual at most market centers. Bar fabricators anticipate considerable work to come out this spring. As a result, they are not holding up steel shipments from the mills.

An active construction season is reported in prospect in the Pacific Northwest where bar mills are reported carrying sufficient backlogs to support capacity operations. Many large projects requiring building bars are reported in the development stage.

Northwest Steel Rolling Mills Inc., Seattle, has resumed operations after its annual shutdown for overahul. The furnaces operated throughout the shutdown.

Ferroalloys . . .

Ferroalloy Prices, Page 124

Merger of Globe Metallurgical Corp. with Interlake Iron Corp., Cleveland, has been effected, R. W. Thompson, president, Interlake, announced last week. Globe's plant near Beverly, O., produces ferroalloys. Its name has been changed to the Beverly plant of Interlake.

December Steel Record Set

December production of 10,840,000 net tons of ingots, a record for that month, brought steel output for all of 1956 to 115,218,604 net tons, reports the American Iron & Steel Institute.

This was second only to the record output of 117,036,085 tons in 1955. Had it not been for the midsummer strike loss of 11 million tons a record would have been set.

The December output was more than 300,000 tons above the 10,503,519 tons reported for December, 1955.

The final quarter of 1956—with 12 consecutive weeks of capacity-plus operations, a record 11-million-ton month and two 10-million-ton months—set a record for any quarter. The total output was 32,444,013 net tons, comparing with 31,251,967 in the former record fourth quarter of 1955, and

20,167,419 in the third quarter of 1956.

Output in the second half of the year amounted to 52,611,432 net tons. In the first half of the year, a record 62,607,172 tons were produced.

Preliminary figures indicate that the steelmaking furnaces operated at an average of 89.8 per cent of capacity last year, 100.3 per cent in the fourth quarter, and 99.4 per cent in December. Capacity in 1956 was rated at 128,363,090 tons. (As of Jan. 1, 1957, capacity is rated at 133,459,150 net tons annually, up 5,096,060 tons from 1956).

Structural Shapes . . .

Structural Shape Prices, Page 115

Shape supply continues to fall short of demand, with standard sections reportedly more scarce than wide flange due to mounting requirements of shipyards and carbuilders. No early improvement is anticipated despite increasing use of reinforcing steel for moderate sized building jobs.

While bridge work still dominates the structural market, there currently is a diversity of business. Outstanding among awards are 14,000 tons for a 45-story office building at 399 Park Ave., New York.

Kaiser Steel Corp., Oakland, Calif., raised prices on standard and wide flange shapes $1 a ton, effective Jan. 11. The action was taken to compensate for higher freight rates and other costs and brings Kaiser's prices more in line with those now quoted by eastern suppliers.

Upward revisions in extras applicable to hot-rolled carbon steel standard structural shapes have been announced by Republic Steel Corp., Cleveland, effective Jan. 7. The changes are similar to those effected Dec. 28 by Bethlehem Steel Co.

American Institute of Steel Construction reports a sharp climb in November bookings by the industry. Totaling 338,892 tons, they were up 16 per cent over the 290,961 booked during October and represent the highest figure reported since the prestrike month of May. Total bookings for the first 11 months of 1956 were 3,608,775 tons, up 8 per cent over the corresponding period of 1955.

November shipments totaled 276,045 tons, a slight decrease from the previous month, but 7 per cent greater than the same month of 1955. Shipments for the first 11 months last year were 2,907,703 tons, up 6 per cent over the corresponding period of 1955.

Backlogs as of Dec. 1 totaled 3,252,202 tons, of which 1,267,369 were scheduled for fabrication through March.

Steel Ingot Production—December, 1956

	—OPEN HEARTH—		—BESSEMER—		—ELECTRIC—		—TOTAL—	
Period	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity
1956								
January ..	9,676,151	101.4	323,235	79.5	828,845	86.7	10,828,231	99.3
February .	9,043,064	101.3	296,543	78.0	779,388	87.1	10,118,995	99.2
March	9,795,263	102.7	310,060	76.3	819,465	85.7	10,924,788	100.2
1st Qtr. ..	28,514,478	101.8	929,838	77.9	2,427,698	86.5	31,872,014	99.6
April	9,437,945	102.2	306,388	77.9	779,452	84.2	10,523,785	99.7
May	9,370,167	98.2	297,990	73.3	822,219	86.0	10,490,376	96.2
June	8,665,044	93.9	282,846	71.9	773,546	83.6	9,721,436	92.1
2nd Qtr. ..	27,473,156	98.1	887,224	74.3	2,375,217	84.6	30,735,597	96.0
1st 6 Mo..	55,987,634	100.0	1,817,062	76.1	4,802,915	85.6	62,607,611	97.8
July	1,330,151	13.9	.....	....	292,012	30.5	1,622,163	14.9
August ...	7,213,274	75.6	189,564	46.6	719,759	75.3	8,122,597	74.5
September..	9,342,796	101.2	286,978	72.9	792,885	85.7	10,422,659	98.8
3rd Qtr. ..	17,886,221	63.2	476,542	39.5	1,804,656	63.6	20,167,419	62.3
9 Mo.	73,873,416	87.6	2,293,604	63.8	6,607,571	78.2	82,774,591	85.9
October ...	9,841,002	103.2	330,101	81.2	877,410	91.8	11,048,513	101.3
*November .	9,430,248	102.2	295,827	75.2	829,425	89.6	10,555,500	100.0
†December .	9,695,000	101.6	308,000	75.8	837,000	87.5	10,840,000	99.4
†4th Qtr...	28,966,250	102.3	933,928	77.4	2,543,835	89.6	32,444,013	100.3
†2nd Half.	46,852,471	82.7	1,410,470	58.4	4,348,491	76.6	52,611,432	81.3
†Total 1956.	102,839,666	91.6	3,227,532	67.4	9,151,406	81.3	115,218,604	89.8
1955								
January ..	8,054,345	86.0	199,229	49.0	584,162	63.6	8,837,736	82.7
February .	7,734,884	91.5	197,091	53.7	564,959	68.1	8,496,934	88.0
March	9,060,026	96.7	255,493	62.8	666,235	72.6	9,981,754	93.4
1st Qtr. ..	24,849,255	91.4	651,813	55.2	1,815,356	68.1	27,316,424	88.0
April	8,858,549	97.7	275,069	69.8	681,477	76.6	9,815,095	94.8
May	9,307,291	99.4	305,347	75.1	715,678	77.9	10,328,316	96.6
June	8,764,430	96.6	283,544	72.0	698,493	78.6	9,746,467	94.1
2nd Qtr. ..	26,930,270	97.9	863,960	72.3	2,095,648	77.7	29,889,878	95.2
1st 6 Mo..	51,779,525	94.7	1,515,773	63.8	3,911,004	72.9	57,206,302	91.6
July	8,232,535	88.1	268,348	66.1	600,063	65.5	9,100,946	85.3
August ...	8,600,612	91.8	298,972	73.5	694,961	75.7	9,594,545	89.7
September..	8,829,266	97.6	307,171	78.2	745,888	84.1	9,882,325	95.7
3rd Qtr. ..	25,662,413	92.4	874,491	72.6	2,040,912	75.0	28,577,816	90.2
9 Mo.	77,441,938	93.9	2,390,264	66.8	5,951,916	73.6	85,784,118	91.1
October ...	9,369,704	100.0	330,150	81.2	801,196	87.3	10,501,050	98.2
November .	9,141,244	100.8	306,674	77.9	799,480	89.9	10,247,398	99.0
December .	9,406,531	100.7	292,429	72.1	804,559	87.8	10,503,519	98.5
4th Qtr. ..	27,917,479	100.5	929,253	77.0	2,405,235	88.3	31,251,967	98.6
Last Half .	53,579,892	96.5	1,803,744	74.8	4,446,147	81.7	59,829,783	94.4
Total 1955..	105,359,417	95.6	3,319,517	69.3	8,357,151	77.3	117,036,085	93.0

Note—The percentages of capacity operated are calculated on weekly capacities in 1956 of 2,154,144 net tons open hearth, 91,810 net tons bessemer and 215,939 net tons electric ingots and steel for castings, total 2,461,893 net tons; based on annual capacities as of Jan. 1, 1956, as follows: Open hearth 112,317,040 net tons, bessemer 4,787,000 net tons, electric 11,259,050 net tons, total 128,363,090 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1955 of 2,114,196 net tons open hearth, 91,810 net tons bessemer and 207,272 net tons electric ingots and steel for castings, total 2,413,278 net tons; based on annual capacities as of Jan. 1, 1955, as follows: Open hearth 110,234,160 net tons, bessemer 4,787,000 net tons, electric 10,807,150 net tons, total 125,828,310 net tons.

*Revised. †Preliminary figures subject to revision.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

14,000 tons, 45-story office building, Astor Plaza Inc., 399 Park Ave., through George A. Fuller & Co., to Bethlehem Steel Co., Bethlehem, Pa.

4440 tons, state highway work, Westchester county, New York, through Rusciano & Sons Corp., to Delbalso Construction Corp., acting jointly on the general contract, to the Ernst Construction Corp., Buffalo.

4000 tons, power plant, Central Hudson Gas & Electric Co., Roseton, N.Y., through Burns & Roe Inc., general contractor, to Belmont Iron Works, Eddystone, Pa.

1070 tons, state bridge work, Columbia county, New York, through the Union Building & Construction Corp., to the Ernst Construction Corp., Buffalo.

700 tons, state bridge work, Queens county, New York, through the Gull Contracting Co., to the Bethlehem Steel Co., Bethlehem, Pa.

585 tons, bridge, Berks county, Pa., Mayer Pollock Inc., Pottstown, Pa.

570 tons, state highway bridge, Lehigh county, Pa., to the Lehigh Structural Steel Co., Allentown, Pa.

370 tons, five state highway bridges, Chelmsford-Lowell, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Bayer & Mingolla Construction Co., Worcester, Mass., general contractor.

300 tons, foot bridge, between Portland, Pa., and Columbia, N.J., through Lenory Inc. and William Bergin Inc., joint general contractors, to an unnamed fabricator.

250 tons, state bridge work, Ocean county, New Jersey, through the Reid Contracting Co. Inc. to Bethlehem Steel Co., Bethlehem, Pa.

145 tons, state highway bridge, York, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Cianchette Bros. Inc., Pittsfield, Me., general contractor; 55 tons, reinforcing bars, same fabricator.

STRUCTURAL STEEL PENDING

6300 tons, superstructure, Chesapeake & Delaware bridge, Summit, Del., plans expected out before end of January.

6200 tons, bridge structures, Dorchester avenue, Columbia Road over M.T.A. and New Haven railroad, and Boston street, Boston.

3435 tons, steel sheet piling; bids to Corps of Engineers, Detroit.

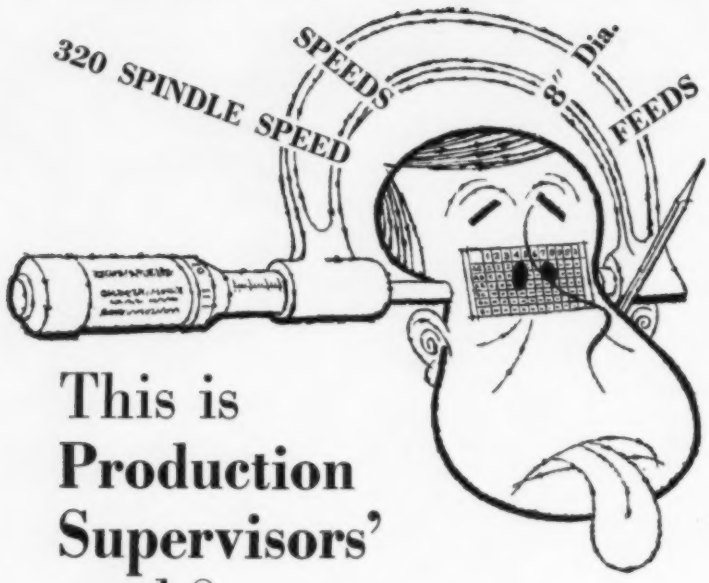
2000 tons, catapult runways and arresting gear, Naval station, Lakehurst, N.J., bids Feb. 13.

725 tons, state bridge, Lehigh county, Pa.; bids Feb. 8.

717 tons, bridges, Tri-State toll route contract T-12C, Libertyville and Warren townships, Lake county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 31.

633 tons, addition to the Seattle light department center; bids in Jan. 16.

825 tons, also steel piling, railroad bridge, third phase of the Eagle Gorge project near Seattle; Paul Jarvis Inc., Seattle, is low at



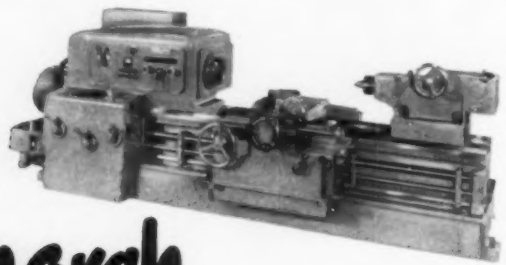
This is Production Supervisors' work?

This, and for years it's been thusly, is a cockeyed waste of time! Why should it take so much of your supervisors' time just to check their turning jobs?

You know and we know why—with all the fiddling and figuring it takes to determine and change speeds on conventional lathes, it's almost standard procedure for the operator to pick out one compromise speed no matter what Methods says. So tool life, finish and production fall far below par while rarely is the full horsepower of the machine being used, unless your supervisor spends so much time camping on the job that it hurts his overall supervisory efficiency!

Now see how you check a Monarch Dyna-Shift Job!
A quick look at the *surface cutting* speed dial.
(The operator has dialed his speed with it.) OK.
A practiced glance at, or a fast mike on
the diameter. OK. Tool and finish. OK. Next!

Monarch Dyna-Shift Lathes give you the "headstock that thinks" and a host of other exclusive features just as advanced. For better quality; for productivity increased up to 25% and tool life up to 50%; for supervisory time made more valuable to your company—arrange now for a demonstration ... *The Monarch Machine Tool Company, Sidney, Ohio.*



Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES
FOR A GOOD TURN FASTER ... TURN TO MONARCH

On the Monarch Dyna-Shift Lathes, you merely dial the desired surface cutting speed—and presto! the machine makes the shift automatically. See them.

$985,716 to the U.S. Engineer, Seattle.

359 tons, bridges, Libertyville township, Lake county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 31.

REINFORCING BARS . . .

REINFORCING BARS PLACED

850 tons, upper Baker river power plant, Washington state, to Bethlehem Pacific Coast Steel Corp., Seattle; Stone & Webster, general contractor for the Puget Sound Power & Light Co.

800 tons, state bridge work, Lehigh county, Pa., to U.S. Steel Supply Division, U.S. Steel Corp., Pittsburgh.

700 tons, parking facilities, Philadelphia Gas Works, Philadelphia, to the American Steel Engineering Co., Philadelphia, through the Fleming Co., general contractor.

365 tons, substructure, Division street bridge, Pawtucket, R.I., to Plantations Steel Co., Providence; General Engineering & Contracting Co., Providence, R.I., general contractor.

350 tons, state bridge, Lehigh county, Pa., through Hack Kessler Co., general contractor, to Taylor-Davis Inc., Philadelphia.

185 tons, five state bridges, Chelmsford-Lowell, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Bayer & Mingolla Construction Co., Worcester, Mass., general contractor.

135 tons, two dormitories and dining hall, Dow AFB Bangor, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Wexler Construction Co., Newton, Mass., general contractor; structurals to American Architectural Iron Works, Boston.

REINFORCING BARS PENDING

5667 tons, Tri-State toll route contract T-12B, including erection of precast concrete bridges, Libertyville township, Lake county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 31.

3000 tons, bridge structures and paving, Northern Illinois toll highway, four contracts, Cook, Kane and DuPage counties; bids Jan. 24, Illinois State Toll Highway Commission, Chicago. Estimates in, two contracts Cook county, 915 tons.

700 tons, Boeing spar mill, Seattle; Sound Construction & Engineering Co., Seattle, is low at $1,002,339.

440 tons, Washington state King county bridge; bids to Olympia, Wash., Jan. 29.

402 tons, Tri-State toll route contract T-12A, including erection of precast concrete bridges, Lake county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 31.

327 tons, Northern Illinois toll highway contract N-6A, including erection of precast concrete bridges, Elgin township, Kane county, Ill., and Hanover township, Cook county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 31.

281 tons, Tri-State toll route contract T-12C, including erection of precast concrete bridges, Libertyville and Warren townships, Lake county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 31.

240 tons, also 25 tons of shapes, dam and irrigation works, Helena Valley Project, Mont.; Bureau of Reclamation will invite bids about Jan. 31.

100 tons, Washington state, Snohomish county, two highway bridges; general contract to J. J. Welcome Construction Co., Redmond, Wash., low at $538,225.

PLATES . . .

PLATES PENDING

110 tons, 300,000-gal storage tank, housing project, Marine Corps, Jacksonville, N.C.; bids, public works office, Norfolk, Va.

200 tons, two storage tanks, Paine Air Field, Everett, Wash.; general contract to Roy E. Earley Co., Tacoma, Wash., low at $112,455 to U.S. Engineer, Seattle; bids opened Nov. 17.

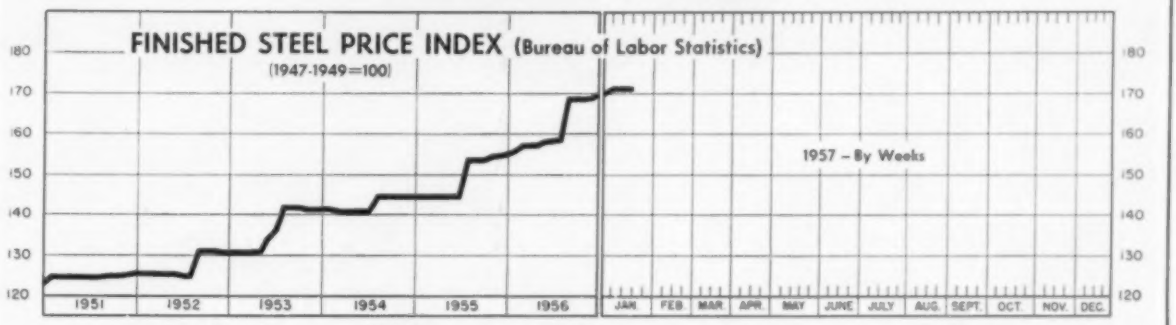
100 tons or more, 500,000-gal water tank, Condon, Oreg.; Law & Easley, Portland, Oreg., is low at $41,320.

PIPE . . .

CAST IRON PIPE PENDING

193 tons, Garden Home Water District, Portland, Oreg.; bids in Jan. 4.

Price Indexes and Composites



Jan. 15, 1957	Week Ago	Month Ago	Dec. Avg.	Year Ago
171.2	171.2	169.3	168.8	155.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 15

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.150	Bars, Reinforcing	5.738
Rails, Light, 40 lb	6.567	Bars, C.F., Carbon	9.610
Tie Plates	6.025	Bars, C.F., Alloy	13.275
Axles, Railway	9.150	Bars, C.F., Stainless, 302 (lb)	0.533
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.945
Plates, Carbon	5.783	Sheets, C.R., Carbon	6.789
Structural Shapes	5.617	Sheets, Galvanized	8.226
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.660
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 403 (lb)	0.475
Bars, H.R., Alloy	10.025	Strip, H.R., Carbon	6.000
Bars, H.R., Stainless, 303 (lb)	0.508	Pipe, Black, Buttweld (100 ft)	18.376
Bars, H.R., Carbon	5.925	Pipe, Galv. Buttweld (100 ft)	22.516
		Pipe, Line (100 ft)	182.860
		Casing, Oil Well, Carbon (100 ft)	178.046
		Casing, Oil Well, Alloy (100 ft)	276.870
		Tubes, Boiler (100 ft)	45.033
		Tubing, Mechanical, Carbon (100 ft)	23.020
		Tubing, Mechanical, Stainless, 304 (100 ft)	189.113
		Tin Plate, Hot-dipped, 1.25 lb	9.433
		Tin Plate, Electrolytic, 0.25 lb	8.133
		Black Plate, Canmaking Quality	7.233
		Wire, Drawn, Carbon	9.175
		Wire, Drawn, Stainless, 430 (lb)	0.630
		Bale Ties (bundle)	7.213
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.412
		Woven Wire Fence (20-rod roll)	20.505

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 16 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	225.92	225.92	225.92	209.10	171.92
Index in cents per lb	6.111	6.111	6.111	5.665	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel NT*	$137.98	$137.98	$137.98	$128.00	$106.32
No. 2 Fdry Pig Iron, GT	62.63	62.63	62.63	58.99	52.54
Basic Pig Iron, GT	62.18	62.18	62.18	58.49	52.16
Malleable Pig Iron, GT	63.41	63.41	63.41	59.77	53.27
Steelmaking Scrap, GT	59.83	60.83	64.83	53.33	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 84; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 16 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld. Philadelphia	5.365	5.365	5.35	4.90	4.223
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	5.90	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.29	4.88	3.918
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.35	4.80	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.20	8.20	8.20	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.95	$9.95	$9.95	$9.45	$8.70

*Including 0.35c for special quality

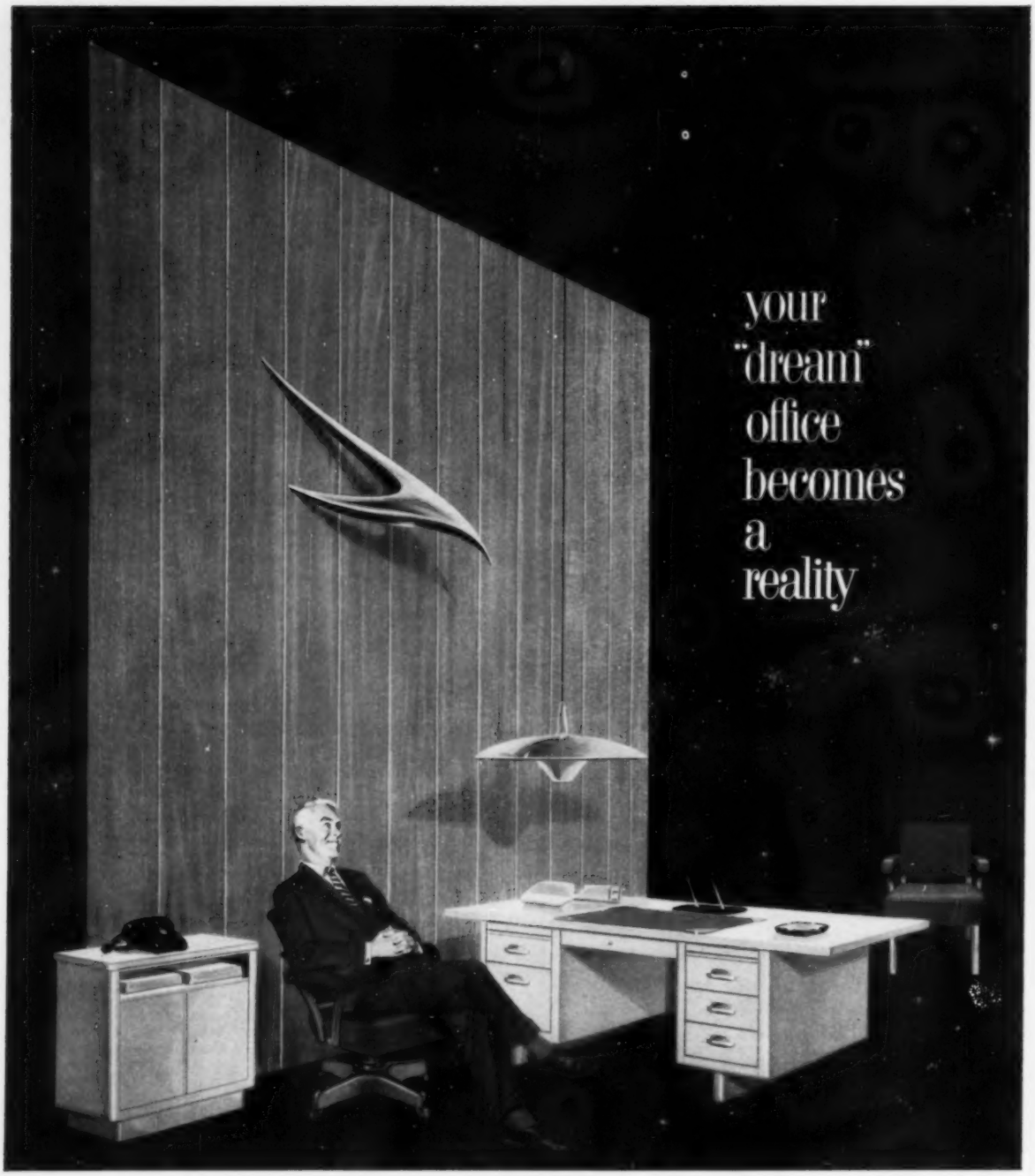
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, ½-⅝" Pitts.	5.80	5.80	5.80	5.025	4.10-4.30

PIG IRON, Gross Ton	Jan. 16 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$63.50	$63.50	$63.50	$59.50	$53.00
Basic, Valley	62.50	62.50	62.50	58.50	52.00
Basic, deld. Phila.	66.38	66.38	66.26	62.16	56.61
No. 2 Fdry, Neville Island, Pa.	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, Chicago	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, deld. Phila.	66.88	66.88	66.76	62.66	57.11
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	63.00	63.00	63.00	59.00	52.50
Malleable, Chicago	63.00	63.00	63.00	59.00	52.50
Ferromanganese, Duquesne	255.00†	255.00†	235.00†	205.00†	188.00**

†74-76% Mn, net ton. **75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$62.50	$62.50	$66.50	$54.50	$44.00
No. 1 Heavy Melt, E. Pa.	59.00	61.00	63.00	55.00	42.50
No. 1 Heavy Melt, Chicago	58.00	59.00	65.00	50.50	42.50
No. 1 Heavy Melt, Valley	63.50	63.50	66.50	57.50	44.00
No. 1 Heavy Melt, Cleve.	60.50	60.50	65.50	54.50	43.00
No. 1 Heavy Melt, Buffalo	61.50	61.50	62.50	47.50	43.00
Rails, Rerolling, Chicago	82.50	84.50	89.50	72.50	52.50
No. 1 Cast, Chicago	50.50	50.50	50.50	51.50	49.00

COKE, Net Ton					
Beehive, Furn, Connisvl.	$15.00	$15.00	$15.00	$14.125	$14.75
Beehive, Fdry, Connisvl.	18.00	18.00	18.00	16.50	17.50



with SCULPTURED STEEL *by* Remington Rand

DIVISION OF SPERRY RAND CORPORATION

Every individual piece of the new Remington Rand ARISTOCRAT® collection of office furniture represents the ultimate in modern craftsmanship and styling—all beautifully integrated for today's concept of office living.

It is superbly engineered to meet the functional needs of efficient business use. Its sophisticated styling, and living color in three delicately beautiful shades, offer a choice to enhance any décor and reflect the overall stability of your entire organization.

Get full particulars on this new collection. Write Room 1171, 315 Fourth Ave., N. Y. 10—ask for catalogs FF187, FF193, FF203.

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 116; to footnotes, page 118.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)

Detroit R7 .....$74.00
Houston S5 .....74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$74.00
Bessemer,Pa. U5 .....74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 .....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
Pittsburgh J5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ...74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$91.50
Bessemer,Pa. U5 .....91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 .....91.50
Houston S5 .....96.50
Johnstown,Pa. B2 .....91.50
Lackawanna,N.Y. B2 ..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Pittsburgh J5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14 91.50
S.Duquesne,Pa. U5 ....91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..$107.00
Bridgeport,Conn. N19 107.00
Buffalo R2 .....107.00
Canton,O. R2 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit R7 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston S5 .....112.00
Ind.Harbor,Ind. Y1 ...107.00
Johnstown,Pa. B2 ...107.00
Lackawanna,N.Y. B2 .107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 107.00
S.Duquesne,Pa. U5 ...107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 .....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2,W14 111.50
S.Duquesne,Pa. U5 ..111.50

SKELP

Aliquippa,Pa. J5 ....4.725
LoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.625
SparrowsPoint,Md. B2 .4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ..4.625

WIRE RODS

AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston S5 .....6.05
IndianaHarbor,Ind. Y1 .5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P7 .....5.80
N.Tonawanda,N.Y. B11 .5.80
Pittsburg,Calif. C11 ....6.45
Portsmouth,O. P12 .....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 .....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....5.00
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.30
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.75
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston S5 .....5.10
Ind.Harbor,Ind. I-2 .....5.00
Johnstown,Pa. B2 .....5.05
KansasCity,Mo. S5 .....5.10
Lackawanna,N.Y. B2 ..5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.75
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.80
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14 ..5.00
S.SanFrancisco B3 ....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 ....5.00

Wide Flange

Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.90
IndianaHarbor,Ind. I-2 ..5.25
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes

Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston S5 .....7.45
Ind.Harbor,Ind. I-2,Y1 7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 .....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 ....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.40
Ind.Harbor,Ind. I-2 ....7.35
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES

Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.90
Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky. (15) A10..4.85
Bessemer,Ala. T2 .....4.85
Bridgeport,Conn. N19 ..4.75
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ...4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 ...5.60
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 ....5.05
Harrisburg,Pa. P4 .....5.00
Houston S5 .....4.95
Ind.Harbor,Ind. I-2, Y1 4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. A2 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14 ..4.85
SparrowsPoint,Md. B2 ..4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Weirton,W.Va. W6 .....4.85
Youngstown R2, U5, Y1 4.85

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....6.20
Fontana,Calif. K1 .....6.75
Geneva,Utah C11 .....6.00
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron

Economy,Pa. B14 .... 11.128

Plates, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 .....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ...8.00
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston S5 .....7.35
Ind.Harbor,Ind. I-2, Y1 7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14 ..7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy

Bridgeport,Conn. N19 ..6.55
Claymont,Del. C22 .....6.85
Coatesville,Pa. L7 .....6.85
Fontana,Calif.(30) K1 ...7.60
Gary,Ind. U5 .....6.85
Houston S5 .....6.95
Ind.Harbor,Ind. Y1 .....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. A2 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14 ..6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES

Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 .....6.275
Ind.Harbor,Ind. I-2 ...5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron

Ashland c.l. (15) A10 .5.10
Ashland l.c.l. (15) A10 .5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon
(Merchant Quality)

Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5 ..5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.575
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ...5.375
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa. U5 .....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ...5.175
Emeryville,Calif. J7 ...5.85
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 .....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Geneva,Utah(9) C11 ...5.175
Houston(9) S5 .....5.325
Ind.Harbor(9) I-2, Y1 ..5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo.(9) S5 ..5.325
Lackawanna(9) B2 .....5.075
LosAngeles(9) B3 .....5.775
Milton,Pa.(23) M18 .....5.425
Minnequa,Colo. C10 ....5.525
Niles,Calif. P1 .....5.55
N.Tonawanda,N.Y.(9)B11 5.075
Pittsburg,Calif.(9) C11 5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.85
Seattle B3, N14 .....5.825
S.Ch'c'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5 ..5.075
S.SanFran.,Calif.(9) B3 5.825
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif.(9) C11 ..5.775
Weirton,W.Va.(9)W6 ..5.075
Youngstown(9) R2, U5 5.075

BARS, H.R. Leaded Alloy
(Including leaded extra)

Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ....6.125
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2 .....6.125
Clairton,Pa. U5 .....6.125
Detroit R7 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.125
Houston S5 .....6.375
Ind.Harbor,Ind. I-2,Y1 6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 .....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
S.Chicago R2,U5, W14 6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy

Aliquippa,Pa. J5 .....7.425
Bessemer,Ala. T2 .....7.425
Bethlehem,Pa. B2 .....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 .....8.125
Gary,Ind. U5 .....7.425
Houston S5 .....7.675
Ind.Harbor,Ind. Y1 ....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. S5 .....7.675
Lackawanna,N.Y. B2 ..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Chicago,Ill. U5, W14 7.425
S.Duquesne,Pa. U5 ....7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.225
Houston S5 .....5.325
KansasCity,Mo. S5 .....5.325
Lackawanna(9) B2 .....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ..5.075

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco S7 .....5.95

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.45
KansasCity,Mo. S5 ....6.45
Youngstown U5 .....6.20

BARS, C.F. Leaded Alloy
(Including leaded extra)

Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.00
Monaca,Pa. S17 .....9.225
Newark,N.J. W18 ....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2 6.85
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 ....6.85
Detroit B5, P17 .....7.05
Detroit R7 .....6.85
Donora,Pa. A7 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ....6.85
Gary,Ind. U5 .....6.85
GreenBay,Wis. F7 ....6.85
Hammond,Ind. L2, M13 .6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles P2, R2 ....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ....6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4 ..6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 ....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 ....6.85
SpringCity,Pa. K3 ....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon
(Turned and Ground)

Cumberland,Md.(5) C19..6.10

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa.M12,R2 8.325
Bethlehem,Pa. B2 .....8.325
Bridgeport,Conn. N19 ..8.475
Bufalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....8.325
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit R7 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 ....8.325
Hammond,Ind. L2, M13 8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles P2, S30 ...10.10
Mansfield,Mass. B5 ....8.625
Massillon,O. R2, R8 ....8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 ....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ....8.625
Youngstown F3, Y1 ....8.325

BARS, Reinforcing
(To Fabricators)

Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.575
Birmingham C15 .....5.375
Bridgeport,Conn. N19 ..5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ...5.85
Fairfield,Ala. T2 .....5.075
Fairless,Pa. U5 .....5.225

with SCULPTURED STEEL *by* Remington Rand

DIVISION OF SPERRY RAND CORPORATION

Every individual piece of the new Remington Rand ARISTOCRAT® collection of office furniture represents the ultimate in modern craftsmanship and styling—all beautifully integrated for today's concept of office living.

It is superbly engineered to meet the functional needs of efficient business use. Its sophisticated styling, and living color in three delicately beautiful shades, offer a choice to enhance any décor and reflect the overall stability of your entire organization.

Get full particulars on this new collection. Write Room 1171, 315 Fourth Ave., N. Y. 10—ask for catalogs FF187, FF193, FF203.

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 116; to footnotes, page 118.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)
Detroit R7 .....$74.00
Houston S5 .....74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$74.00
Bessemer,Pa. U5 .....74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 .....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
Pittsburgh J5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ...74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$91.50
Bessemer,Pa. U5 .....91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 .....91.50
Houston S5 .....96.50
Johnstown,Pa. B2 .....91.50
Lackawanna,N.Y. B2 ..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Pittsburgh J5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14 91.50
S.Duquesne,Pa. U5 ....91.50
S.SanFrancisco B3 ....101.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$107.00
Bridgeport,Conn. N19 107.00
Buffalo R2 .....107.00
Canton,O. R2 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit R7 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston S5 .....112.00
Ind.Harbor,Ind. Y1 ..107.00
Johnstown,Pa. B2 .....107.00
Lackawanna,N.Y. B2 ..107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 107.00
S.Duquesne,Pa. U5 ..107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 .....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2,W14 111.50
S.Duquesne,Pa. U5 ..111.50

SKELP
Aliquippa,Pa. J5 ....4.725
LoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.625
SparrowsPoint,Md. B2 .4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ..4.625

WIRE RODS
AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston S5 .....6.05
Indiana Harbor,Ind. Y1 .5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P7 .....5.80
N.Tonawanda,N.Y. B11.5.80
Pittsburg,Calif. C11 ....6.45
Portsmouth,O. P12 ....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 ....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.00
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.30
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.75
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston S5 .....5.10
Ind.Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 .....5.05
KansasCity,Mo. S5 ....5.10
Lackawanna,N.Y. B2 ..5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.75
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.80
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14 .5.00
S.SanFrancisco B3 ....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 ....5.00

Wide Flange
Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.90
IndianaHarbor,Ind. I-2..5.25
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston S5 .....7.45
Ind.Harbor,Ind. I-2,Y1 7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 ....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 ....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.40
Ind.Harbor,Ind. I-2 ....7.35
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...5.90
Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky. (15) A10..4.85
Bessemer,Ala. T2 .....4.85
Bridgeport,Conn. N19 ..4.75
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ...4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 ...5.60
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 ....5.05
Harrisburg,Pa. P1 .....5.80
Houston S5 .....4.95
Ind.Harbor,Ind. I-2, Y1 4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. A2 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14 .4.85
SparrowsPoint,Md. B2 ..4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Weirton,W.Va. W6 ....4.85
Youngstown R2, U5, Y1 4.85

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.20
Fontana,Calif. K1 .....6.75
Geneva,Utah C11 .....6.00
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 ... 11.128

Plates, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 .....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ...7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ...8.00
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston S5 .....7.35
Ind.Harbor,Ind. I-2, Y1 7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14 .7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy
Bridgeport,Conn. N19 ..6.55
Claymont,Del. C22 .....6.85
Coatesville,Pa. L7 .....6.85
Fontana,Calif.(30) K1 ...7.60
Gary,Ind. U5 .....6.85
Houston S5 .....6.95
Ind.Harbor,Ind. Y1 .....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. A2 .....6.85
Seattle B2 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14 .6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES
Cleveland J5 .....5.928
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 .....6.275
Ind.Harbor,Ind. I-2 ...5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron
Ashland c.l. (15) A10 .5.10
Ashland l.c.l. (15) A10 .5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala. (9) R2 ..5.075
Aliquippa,Pa.(9) J5 ..5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.575
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ...5.375
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa. U5 .....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ....5.175
Emeryville,Calif. J7 ...5.85
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 ....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Geneva,Utah(9) C11 ...5.178
Houston(9) S5 .....5.320
Ind.Harbor(9) I-2, Y1 .5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo.(9) S5 .5.325
Lackawanna(9) B2 .....5.075
LosAngeles(9) B3 .....5.775
Milton,Pa.(23) M18 ....5.425
Minnequa,Colo. C10 ....5.525
Niles,Calif. P1 .....5.85
N.Tonawanda,N.Y.(9)B11 5.075
Pittsburg,Calif.(9) C11.5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.85
Seattle B3, N14 .....5.825
S.Ch'c'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5 .5.075
S.SanFran.,Calif.(9) B3 5.825
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif.(9) C11 .5.775
Weirton,W.Va.(9)W6 ..5.075
Youngstown(9) R2, U5 5.075

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....6.125
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2 .....6.125
Clairton,Pa. U5 .....6.125
Detroit R7 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.125
Houston S5 .....6.375
Ind.Harbor,Ind. I-2,Y1 6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 ....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
S.Chicago R2,U5, W14 6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.425
Bessemer,Ala. T2 .....7.425
Bethlehem,Pa. B2 .....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 .....8.125
Gary,Ind. U5 .....7.425
Houston S5 .....7.675
Ind.Harbor,Ind. Y1 ....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. S5 ....7.675
Lackawanna,N.Y. B2 ..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Chicago,Ill. U5, W14 7.425
S.Duquesne,Pa. U5 ....7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.225
Houston S5 .....5.325
KansasCity,Mo. S5 ....5.325
Lackawanna(9) B2 .....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ..5.075

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco S7 .....5.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.45
KansasCity,Mo. S5 ....6.45
Youngstown U5 .....6.20

BARS, C.F. Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.00
Monaca,Pa. S17 .....9.225
Newark,N.J. W18 ....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2 6.85
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 ....6.85
Detroit B5, P17 .....7.05
Detroit R7 .....6.85
Donora,Pa. A7 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ....6.85
Gary,Ind. U5 .....6.85
GreenBay,Wis. F7 ....6.85
Hammond,Ind. L2, M13.6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles P2, R2 ....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ....6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4 ..6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P8 .....7.10
Putnam,Conn. W18 .....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 .....6.85
SpringCity,Pa. K3 .....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19.6.10

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa.M12,R2 8.325
Bethlehem,Pa. B2 .....8.325
Bridgeport,Conn. N19 ..8.475
Bufalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....8.325
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit R7 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 ....8.325
Hammond,Ind. L2, M13 8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles P2, S30 ..10.10
Mansfield,Mass. B5 ..8.625
Massillon,O. R2, R8 ..8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. B17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 ....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ..8.625
Youngstown F3, Y1 ..8.325

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.575
Birmingham C15 .....5.375
Bridgeport,Conn. N19 ..5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ...5.85
Fairfield,Ala. T2 .....5.075
Fairless,Pa. U5 .....5.225

Ft.Worth,Tex.(42) T4 .5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.85
Pittsburg,Calif. C11 ..5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 .....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2..5.075
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif. C11 ...5.775
Youngstown R2, U5 ...5.075

BARS, Reinforcing (Fabricated; to Consumers)

Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2.6.73
KansasCity,Mo. S5 .....7.00
Marion,O. P11 .....6.70
NewYork U8 .....7.18
Pittsburgh U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ¼-1" B2 ..6.73
Williamsport,Pa. S19 ...6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2.5.075
ChicagoHts.(4) I-2 ....5.075
ChicagoHts.(4) C2 .....5.65
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(4) F5 ....5.60
Franklin,Pa.(3) F5 ....5.10
JerseyShore,Pa.(4) J8 ..5.00
Marion,O.(3) P11 .....5.15
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 .....5.65
Tonawanda(4) B12 .....6.15
Williamsport,Pa.(3) S19.5.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 12.305
Economy,Pa.(D.R.)B14 15.301
Economy(Staybolt)B14 15.676
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5.19.15

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ..4.675
Cleveland J5, R2 .....4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Dravosburg,Pa. U5 ....4.675
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 .....5.525
Gary,Ind. U5 .....4.675
Geneva,Utah C11 .....4.775
GraniteCity,Ill.(8) G4 ..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) A2 ....4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ...5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ...4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 ....7.75
Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
Newport,Ky. A2 .....7.75
Youngstown Y1, U5 ....7.75

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.90
Conshohocken,Pa. A3 ...6.95
Dravosburg,Pa. U5 .....6.90
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 .....7.75
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1 6.90
Lackawanna(35) B2 ....6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2 ..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 ....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.925
Cleveland R2 .....5.425
Ind.Harbor,Ind. I-2 ...4.925
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 ...5.80
Detroit M1 .....5.75
Dravosburg,Pa. U5 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 ....5.95
Ind.Harbor,Ind. I-2, Y1 5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 .....5.75
Newport,Ky. A2 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
SparrowsPoint,Md. B2..5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 ....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Dravosburg,Pa. U5 ....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 .....9.775
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1.8.525
Lackawanna(37) B2 ...8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2 .8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	6.65	6.90
Canton,O. R2	6.65	7.15
Dravosburg U5	6.65	6.90
Fairfield T2	6.65	6.90
Gary,Ind. U5	6.65	6.90
GraniteCity,Ill.G4	6.85	...
Ind.Harbor I-2	6.65	6.90
Kokomo,Ind. C16	6.75	...
MartinsFry. W10	6.65	...
Pittsburgh J5	...	6.65
Pitts.,Calif. C11	7.40	...
SparrowsPt. B2	6.65	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90
MartinsFry.,O. W10 ....6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Dravosburg,Pa. U5 ....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ...6.30†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ...6.30*
Middletown,O. A10 ....6.30†
Pittsburg,Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ...6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.025

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ...9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Dravosburg,Pa. U5 ....6.70
Kokomo,Ind. C16 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.95
Butler,Pa. A10 (type 2) 9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Dravosburg,Pa. U5 ....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.35
Ind.Harbor,Ind. I-2 ....8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 .....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 ....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Corp.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman & Scott
M21 Mallory-Sharon Titanium Corp.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div..EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.675
Allenport, Pa. P7	4.675
Alton, Ill. L1	4.875
Ashland, Ky. (8) A10	4.675
Atlanta A11	4.875
Bessemer, Ala. T2	4.675
Birmingham C15	4.975
Bridgeport, Conn. N19	4.625
Buffalo (27) R2	4.675
Conshohocken, Pa. A3	4.725
Detroit M1	4.775
Ecorse, Mich. G5	4.775
Fairfield, Ala. T2	4.675
Fontana, Calif. K1	*5.525*
Gary, Ind. U5	4.675
Houston S5	4.925
Ind. Harbor, Ind. I-2, Y1	4.675
Johnstown, Pa. (25) B2	4.675
Kansas City, Mo. S5	4.925
Lackaw'na, N.Y. (25) B2	4.675
Los Angeles (25) B3	5.425
Minnequa, Colo. C10	5.775
Pittsburg, Calif. C11	5.425
Riverdale, Ill. A1	4.675
San Francisco S7	5.95
Seattle (25) B3	5.675
Seattle N14	5.675
Sharon, Pa. S3	4.675
S. Chicago, Ill. W14	4.675
S. San Francisco (25) B3	5.425
Sparrows Point, Md. B2	4.675
Sterling, Ill. (1) N15	4.675
Sterling, Ill. N15	4.775
Torrance, Calif. C11	5.425
Warren, O. R2	4.675
Weirton, W.Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. N19	7.50
Carnegie, Pa. S18	7.75
Dravosburg, Pa. U5	7.75
Gary, Ind. U5	7.75
Ind. Harbor, Ind. Y1	7.75
Los Angeles B3	8.95
Newport, Ky. A2	7.75
Sharon, Pa. S3	7.75
S. Chicago, Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer, Ala. T2	6.95
Conshohocken, Pa. A3	6.95
Ecorse, Mich. G5	7.05
Fairfield, Ala. T2	6.95
Gary, Ind. U5	6.95
Houston S5	7.20
Ind. Harbor, Ind. I-2, Y1	6.95
Kansas City, Mo. S5	7.20
Lackawanna, N.Y. B2	6.95
Los Angeles (25) B3	7.70
Seattle (25) B3	7.95
Sharon, Pa. S3	6.95
S. San Francisco (25) B3	7.70
Sparrows Point, Md. B2	6.95
Warren, O. R2	6.95
Weirton, W.Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.925
Warren, O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken, Pa. A3	6.90
Dearborn, Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover, O. G6	6.85
Ecorse, Mich. G5	6.95
Follansbee, W.Va. F4	6.85
Fontana, Calif. K1	*8.70*
Franklin Park, Ill. T6	6.95
Ind. Harbor, Ind. Y1	6.85
Indianapolis C8	7.00
Los Angeles C1	8.80
New Bedford, Mass. R10	7.30
New Britain (10) S15	6.85
New Castle, Pa. B4, E5	6.85
New Haven, Conn. D2	7.30
New Kensington, Pa. A6	6.85
Pawtucket, R.I. R3	7.50
Pawtucket, R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale, Ill. A1	6.95
Rome, N.Y. (32) R6	6.85
Sharon, Pa. S3	6.85
Trenton, N.J. (31) R5	8.30
Wallingford, Conn. W2	7.30
Warren, O. R2, T5	6.85
Weirton, W.Va. W6	6.85
Worcester, Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie, Pa. S18	14.55
Cleveland A7	14.55
Dover, O. G6	14.55
Franklin Park, Ill. T6	14.55
Harrison, N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket, R.I. N8	14.90
Sharon, Pa. S3	14.55
Worcester, Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn, Mich. D3	10.10
Dover, O. G6	10.10
Ecorse, Mich. G5	10.10
Ind. Harbor, Ind. Y1	10.20
Sharon, Pa. S3	10.00
Warren, O. R2	10.00
Weirton, W.Va. W6	10.20
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.36-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	8.50	10.10	12.30	15.30	18.25
Boston T6	8.50	10.10	12.30	15.30	18.25
Bristol, Conn. W1	...	...	12.30	15.30	18.25
Carnegie, Pa. S18	...	9.80	12.00	15.00	....
Cleveland A7	7.95	9.80	12.00	15.00	17.95
Cleveland C7	...	9.80	12.00	15.00	17.95
Dover, O. G6	7.95	9.80	12.00	15.00	17.95
Detroit D2	8.05	9.90	12.10	15.10	....
Dearborn, Mich. D3	8.05	9.30	12.10	....	....
Franklin Park, Ill. T6	8.05	9.80	12.00	15.00	17.95
Harrison, N.J. C18	...	...	12.30	15.30	18.25
Indianapolis C8	8.10	9.95	12.00	15.00	17.95
New Britain, Conn. (10) S15	7.95	9.80	12.00	15.00	17.95
New Castle, Pa. B4, E5	7.95	9.80	12.00	15.00	....
New Haven, Conn. D2	8.40	10.10	12.30	15.30	....
New Kensington, Pa. A6	7.95	9.80	12.00	15.00	....
New York W3	...	10.10	12.30	15.30	18.25
Pawtucket, R.I. N8	8.50	10.10	12.30	15.30	18.25
Riverdale, Ill. A1	8.05	9.80	12.00	15.00	17.95
Rome, N.Y. (32) R6	7.95	9.80	12.00	15.00	17.95
Sharon, Pa. S3	7.95	9.80	12.00	15.00	17.95
Trenton, N.J. R5	...	10.10	12.30	15.30	18.25
Wallingford, Conn. W2	8.40	10.10	12.30	15.30	18.15
Warren, O. T5	7.95	9.80	12.00	15.00	17.95
Weirton, W.Va. W6	7.95	9.80	12.00	15.00	17.95
Worcester, Mass. A7, T6	8.50	10.10	12.30	15.30	18.25
Youngstown C8	7.95	9.80	12.00	15.00	17.95

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	16.80	20.65	....
Buffalo W12	16.80	....	....
Franklin Park, Ill. T6	17.15	21.00	25.35
Harrison, N.J. C18	16.80	20.65	25.00
New York W3	16.80	20.65	25.00
Palmer, Mass. W12	16.80	....	....
Trenton, N.J. R5	16.80	20.65	25.00
Worcester, Mass. A7, T6	16.80	20.65	25.00
Youngstown C8	17.15	21.00	25.35

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	7.60

STRIP, C.R. Electrogalvanized

Cleveland A7	6.85*
Dover, O. G6	6.85*
Riverdale, Ill. A1	6.95*
Warren, O. B9, T5	6.85*
Worcester, Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon, Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale, Ill. A1	5.25
Sharon, Pa. S3	5.10
Youngstown U5	5.10

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom, W.Va. W10	...	...	11.00	12.05	13.05
Brackenridge, Pa. A4	...	...	11.00	12.50	13.05
Mansfield, O. E6	9.20	10.35	11.00	12.05	13.05
Newport, Ky. A2	9.20	10.35	11.00	12.05	13.05
Niles, O. M21	9.20	10.35	11.00	12.05	....
Vandergrift, Pa. U5	...	10.35	11.00	12.05	13.05
Warren, O. R2	9.20	10.35	11.00	12.05	....
Zanesville, O. A10	...	10.35	11.00	12.05	13.05
Zanesville, O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville, O. A10 (SP coils)	...	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge, Pa. A4	....	....	11.525	12.575	13.55
Granite City, Ill. G4	9.40*	10.55*	11.225*†	12.275*	....
Indiana Harbor, Ind. I-2	9.20†	10.35*	11.025*†	12.075*	....
Mansfield, O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift, Pa. U5	9.20*	10.35*	11.025*†	12.075*	13.05*
Vandergrift, Pa. U5	....	10.85†	11.525††	12.575†	13.55†
Warren, O. R2	9.20*	10.85	11.525	12.575	13.55

	Transformer Grades			
H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
Beech Bottom, W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge, Pa. A4	14.05	....	....	....
Vandergrift, Pa. U5	14.05	14.60	15.10	16.15
Zanesville, O. A10	14.05	14.60	15.10	16.15

	Grain Oriented				
C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge, Pa. A4	16.90	18.50	19.00	19.50	14.05**
Butler, Pa. A10	....	....	18.50	19.00	19.50	....
Vandergrift, Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren, O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$8.40	$8.65	$9.05
Dravosburg, Pa. U5	8.40	8.65	9.05
Fairfield, Ala. T2	8.50	8.75	9.15
Fairless, Pa. U5	8.50	8.75	9.15
Fontana, Calif. K1	9.15	9.40	9.80
Gary, Ind. U5	8.40	8.65	9.05
Granite City, Ill. G4	8.50	8.75	9.15
Indiana Harbor, Ind. I-2, Y1	8.40	8.65	9.05
Niles, O. R2	8.40	8.65	9.05
Pittsburg, Calif. C11	9.15	9.40	9.80
Sparrows Point, Md. B2	8.50	8.75	9.15
Weirton, W.Va. W6	8.40	8.65	9.05
Yorkville, O. W10	8.40	8.65	9.05

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa, Pa. J5	7.425	....	....
Niles, O. R2	7.425	7.625	7.925

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa, Pa. J5	$9.70	$9.95
Dravosburg, Pa. U5	9.70	9.95
Fairfield, Ala. T2	9.80	10.05
Fairless, Pa. U5	9.80	10.05
Fontana, Calif. K1	10.45	10.70
Gary, Ind. U5	9.70	9.95
Pitts., Calif. C11	10.45	10.70
Sp. Pt., Md. B2	9.80	10.05
Weirton, W.Va. W6	9.70	9.95
Yorkville, O. W10	9.70	9.95

BLACK PLATE (Base Box)

Aliquippa, Pa. J5	$7.50
Dravosburg, Pa. U5	7.50
Fairfield, Ala. T2	7.60
Fairless, Pa. U5	7.60
Fontana, Calif. K1	8.25
Gary, Ind. U5	7.50
Granite City, Ill. G4	7.60
Ind. Harbor, Ind. I-2, Y1	7.50
Niles, O. R2	7.50
Pittsburg, Calif. C11	8.25
Sparrows Point, Md. B2	7.60
Weirton, W.Va. W6	7.50
Yorkville, O. W10	7.50

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa, Pa. J5	$7.15
Dravosburg, Pa. U5	7.15
Gary, Ind. U5	7.15
Granite City, Ill. G4	7.25
Ind. Harbor, Ind. Y1	7.15
Yorkville, O. W10	7.15

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg, Pa. U5	$9.20
Gary, Ind. U5	9.30

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary, Ind. U5	$10.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

Alabama City, Ala. R2	7.20
Aliquippa, Pa. J5	7.20
Alton, Ill. L1	7.40
Atlanta A11	7.40
Bartonville, Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville, Ind. M8	7.30
Donora, Pa. A7	7.20
Duluth A7	7.20
Fairfield, Ala. T2	7.20
Fostoria, O. (24) S1	7.30
Houston S5	7.45
Jacksonville, Fla. M8	7.55
Johnstown, Pa. B2	7.20
Joliet, Ill. A7	7.20
Kansas City, Mo. S5	7.45
Kokomo, Ind. C16	7.30
Los Angeles B3	8.15
Minnequa, Colo. C10	7.45
Monessen, Pa. P7, P16	7.20
N. Tonawanda, N.Y. B11	7.20
Palmer, Mass. W12	7.50
Pittsburg, Calif. C11	8.15
Portsmouth, O. P12	7.20
Rankin, Pa. A7	7.20
S. Chicago, Ill. R2	7.20
S. San Francisco C10	8.15
Sparrows Point, Md. B2	7.30
Sterling, Ill. (1) N15	7.20
Sterling, Ill. N15	7.30
Struthers, O. Y1	7.20
Waukegan, Ill. A7	7.20
Worcester, Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville, Ill. K4	11.75
Buffalo W12	11.75
Johnstown, Pa. B2	11.75
Minnequa, Colo. C10	11.875
Monessen, Pa. P16	11.75
Muncie, Ind. I-7	11.95
Palmer, Mass. W12	12.05
Pittsburg, Calif. C11	12.55
Portsmouth, O. P12	11.75
Roebling, N.J. R5	12.05
Sparrows Pt., Md. B2	11.85
Struthers, O. Y1	11.75

ROPE WIRE (A)

Bartonville, Ill. K4	11.55
Buffalo W12	11.55
Fostoria, O. S1	11.55
Johnstown, Pa. B2	11.55
Monessen, Pa. P7, P16	11.55
Muncie, Ind. I-7	11.75
Palmer, Mass. W12	11.85
Portsmouth, O. P12	11.55
Roebling, N.J. R5	11.85
Sparrows Pt., Md. B2	11.65
Struthers, O. Y1	11.55
Worcester, Mass. J4	11.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Upholstery Spring

Aliquippa, Pa. J5	8.40
Alton, Ill. L1	8.60
Buffalo W12	8.40
Cleveland A7	8.40
Donora, Pa. A7	8.40
Duluth A7	8.40
Johnstown, Pa. B2	8.40
Kansas City, Mo. S5	8.65
Los Angeles B3	9.35
Minnequa, Colo. C10	8.60
Monessen, Pa. P7, P16	8.40
New Haven, Conn. A7	8.70
Palmer, Mass. W12	8.70
Pittsburg, Calif. C11	9.35
Portsmouth, O. P12	8.40
Roebling, N.J. R5	8.70
S. Chicago, Ill. R2	8.40
S. San Francisco C10	9.35
Sparrows Point, Md. B2	8.50
Struthers, O. Y1	8.40
Trenton, N.J. A7	8.70
Waukegan, Ill. A7	8.40
Worcester, Mass. A7	8.70

WIRE, MB Spring, High Carbon

Aliquippa, Pa. J5	8.725
Alton, Ill. L1	8.925
Bartonville, Ill. K4	8.825
Buffalo W12	8.725
Cleveland A7	8.725
Donora, Pa. A7	8.725
Duluth A7	8.725
Fostoria, O. S1	8.775
Johnstown, Pa. B2	8.725
Los Angeles B3	9.675
Milbury, Mass. (12) N6	9.025
Minnequa, Colo. C10	8.975
Monessen, Pa. P7, P16	8.725
Muncie, Ind. I-7	8.925
Palmer, Mass. W12	9.025
Pittsburg, Calif. C11	9.675
Portsmouth, O. P12	8.725
Roebling, N.J. R5	9.025
S. Chicago, Ill. R2	8.725
S. San Francisco C10	9.675
Sparrows Pt., Md. B2	8.825
Struthers, O. Y1	8.725
Trenton, N.J. A7	9.025
Waukegan, Ill. A7	8.725
Worcester A7, J4, T6	9.025

WIRE, Fine & Weaving (8" Coils)

Alton, Ill. L1	14.35
Bartonville, Ill. K4	14.25
Buffalo W12	14.15
Chicago W13	13.55
Cleveland A7	14.15
Crawfordsville, Ind. M8	14.25
Fostoria, O. S1	14.15
Jacksonville, Fla. M8	14.50
Johnstown, Pa. B2	14.15
Kokomo, Ind. C16	14.15
Minnequa, Colo. C10	13.90
Monessen, Pa. P6	14.15
Muncie, Ind. I-7	14.35
Palmer, Mass. W12	14.45
Roebling, N.J. C10	14.45
S. San Francisco C10	14.50
Waukegan, Ill. A7	14.15
Worcester, Mass. A7, T6	14.45

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.25
Monessen,Pa. P16	15.45
Roebling,N.J. R5	15.60

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	10.75
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES,

Stock	Col.
AlabamaCity,Ala. R2	.164
Aliquippa,Pa. (7) J5	.167
Atlanta A11	.166
Bartonville,Ill. (7) K4	.169
Crawfordsville,Ind. M8	.166
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex. S5	.169
Jack'ville,Fla. (20) M8	.175
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
KansasCity,Mo. S5	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	.169
Monessen,Pa. (7) P7	.167
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill. (1) N15	.164
Worcester,Mass. A7	.170

NAILS, Stock — Col.

Chicago (7) W13	.167
Cleveland (7) A9	.173

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg) To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.53
Atlanta A11	9.63
Bartonville,Ill. K4	10.13
Buffalo W12	10.05
Crawfordsville,Ind. M8	9.63
Donora,Pa. A7	9.53
Duluth A7	9.53
Houston S5	9.78
Jack'ville,Fla. M8	10.09
Johnstown,Pa. B2	9.53
Joliet,Ill. A7	9.53
KansasCity,Mo. S5	9.78
Kokomo,Ind. C16	9.63
LosAngeles B3	10.32
Minnequa,Colo. C10	9.78
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.53
S.SanFrancisco C10	10.31
SparrowsPt.,Md. B2	9.63
Sterling,Ill.(1) N15	9.53

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.85
Atlanta A11	9.95
Bartonville,Ill. K4	10.45
Buffalo W12	10.35
Crawfordsville,Ind. M8	9.95
Donora,Pa. A7	9.85
Duluth A7	9.85
Houston S5	10.10
Kokomo,Ind. C16	9.95
Jacksonville,Fla. M8	10.41
Johnstown,Pa. B2	9.85
Joliet,Ill. A7	9.85
KansasCity,Mo. S5	10.10
Kokomo,Ind. C16	10.45
LosAngeles B3	10.65
Minnequa,Colo. C10	10.10
Pittsburg,Calif. C11	10.65
S.Chicago,Ill. R2	9.85
S.SanFrancisco C10	10.65
SparrowsPt.,Md. B2	9.95
Sterling,Ill.(1) N15	9.85

Coil Interim

AlabamaCity,Ala. R2	$9.90
Atlanta A11	10.00
Bartonville,Ill. K4	10.50
Buffalo W12	10.40
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	9.90
Duluth A7	9.90
Houston S5	10.15
Jacksonville,Fla. M8	10.46
Johnstown,Pa. B2	9.90
Joliet,Ill. A7	9.90
KansasCity,Mo. S5	10.15
Kokomo,Ind. C16	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	10.15
Pittsburg,Calif. C11	10.70
S.Chicago,Ill. R2	9.90
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	10.00
Sterling,Ill.(1) N15	9.90

WIRE, Barbed — Col.

AlabamaCity,Ala. R2	.184**
Aliquippa,Pa. J5	.185§
Atlanta A11	.190**
Bartonville,Ill. K4	.193
Crawfordsville,Ind. M8	.190
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex. S5	.189**
Jacksonville,Fla. M8	.195
Johnstown,Pa. B2	.183**
Joliet,Ill. A7	.184†
KansasCity,Mo. S5	.189**
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	.189**
Monessen,Pa. P7	.191*
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184**
S.SanFrancisco C10	.207**
SparrowsPoint,Md. B2	190*
Sterling,Ill.(1) N15	.188*

WOVEN FENCE, 9-15 Ga. — Col.

Ala.City,Ala. R2	.176**
Aliq'ppa,Pa. 9-14½ga. J5	184§
Atlanta A11	.182*
Bartonville,Ill. K4	.187
Crawfordsville,Ind. M8	.182
Donora,Pa. A7	.176†
Duluth A7	.176†
Fairfield,Ala. T2	.176†
Houston,Tex. S5	.181**
Jacksonville,Fla. M8	.187
Johnstown,Pa.(43) B2	.180*
Joliet,Ill. A7	.176†
KansasCity,Mo. S5	.181**
Kokomo,Ind. C16	.178†
Minnequa,Colo. C10	.181**
Monessen,Pa. 9 ga. P7	185*
Pittsburg,Calif. C11	.199†
Rankin,Pa. A7	.176†
S.Chicago,Ill. R2	.176**
Sterling,Ill.(1) N15	.180*

WIRE (16 gage)

	An'ld Galv.	Stone
Ala.City,Ala. R2	15.70	17.25**
Bartonville K4	16.10	18.05
Buffalo W12	16.10	----
Cleveland A7	15.70	17.25†
Crawf'dsville M8	15.80	17.75
Fostoria,O. S1	16.20	17.75†
Houston S5	15.95	17.50**
Jacksonville M8	16.05	18.00
Johnstown B2	16.10	18.05*
Kan.City,Mo.85	15.95	17.50**
Kokomo C16	15.80	17.35†
Minnequa C10	16.05	17.75**
P'im'r,Mass.W2	16.10	17.65*
Pitts.,Calif. C11	16.05	17.60†
SparrowsPt. B2	16.20	18.15*
Sterling(1) N15	16.10	18.05*
Waukegan A7	15.70	17.25†
Worcester A7	16.00	----

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	7.95 8.35**
Aliquippa J5	8.10 8.625§
Atlanta A11	8.05 8.65*
Bartonville(48) K4	8.20 8.80
Buffalo W12	8.10 8.50†
Cleveland A7	7.95 ----
Crawfordsville M8	8.05 8.65
Donora,Pa. A7	7.95 8.35†
Duluth A7	7.95 8.35†
Fairfield T2	7.95 8.35†
Houston(48) S5	8.20 8.60**
Jacks'ville,Fla. M8	8.30 8.90
Johnstown B2(48)	7.95 8.55*
Joliet,Ill. A7	7.95 8.35†
Kans.City(48) S5	8.20 8.60**
Kokomo C16	8.05 8.45†
LosAngeles B3	8.90 9.50*
Minnequa, C10	8.20 8.60**
Monessen P7 (48)	8.10 8.70*
Palmer,Mass. W12	8.40 8.80†
Pitts.,Calif. C11	8.90 9.30†
Portsmouth,O. P12	7.95 ----
Rankin,Pa. A7	7.95 8.35†
S.Chicago R2	7.95 8.35**
S.SanFran. C10	8.90 9.30**
Spar'wsPt. B2(48)	8 05 8.65*
Sterling(1)(48)N15	7.95 8.55*
Struth'rs,O.(48)Y1	7.95 8.45‡
Worcester,Mass.A7	8.25 8.65†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10. ††13c. **Subject to zinc equalization extras.

BALE TIES, Single Loop — Col.

AlabamaCity,Ala. R2	.190
Atlanta A11	.192
Bartonville,Ill. K4	.197
Crawfordsville,Ind. M8	.192
Donora,Pa. A7	.190
Duluth A7	.190
Fairfield,Ala. T2	.190
Houston S5	.195
Jacksonville,Fla. M8	.197
Joliet,Ill. A7	.190
KansasCity,Mo. S5	.195
Kokomo,Ind. C16	.192
Minnequa,Colo. C10	.195
Pitts.,Calif. C11	.214
S.Chicago,Ill. R2	.190
S.SanFrancisco C10	.214
Sterling,Ill. N15	.190
SparrowsPoint,Md. B2	.192
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	.167
Duluth A7	.167
Franklin,Pa. F5	.167
Huntington,W.Va. W7	.169
Johnstown,Pa. B2	.167
Marion,O. P11	.167
Minnequa,Colo. C10	.172
Sterling,Ill. N15	.167
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller; 6 in. and shorter	55
Longer than 6 in.	46.5
⅞ in. thru 1 in.: 6 in. and shorter	46.5
Longer than 6 in.	44
1⅛ in. and larger: All lengths	44

Undersized Body (rolled thread)

½ in. and smaler: 6 in. and shorter	55

Carriage, Machine, Lag Bolts Hot Galvanized:

½ in. and smaller: 6 in. and shorter	35
Longer than 6 in.	23
⅝ in. thru 1 in.: 6 in. and shorter	20
Longer than 6 in.	20
1⅛ in. and larger: All lengths	20

Lag Bolts

All diameters: 6 in. and shorter	55
Longer than 6 in.	47

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	54
Larger than ½ in. or longer than 6 in.	47

Blank Bolts 47

Step, Elevator, Tire Bolts 54

NUTS

Reg. & Heavy Square Nuts: All sizes	59
Square Nuts, Reg. & Heavy, Hot Galvanized: All sizes	45

Hex Nuts, Reg. & Heavy, Hot Pressed:

¼ in. and smaller	63
⅜ in. to 1 in., incl.	59.5
1⅛ in. to 1½ in., incl.	64
1⅝ in. and larger	58

Hex Nuts, Reg. & Heavy, Cold Punched:

¼ in. and smaller..	63
⅜ in. to 1½ in., incl.	59.5
1⅝ in. and larger	58

Hex Nuts, All Types, Hot Galvanized:

¼ in. and smaller..	50
⅜ in. to 1 in., incl.	46
1⅛ in. to 1½ in., incl.	51

Hex Nuts, Semifinished, Reg. & Heavy (Incl. Slotted):

¼ in. and smaller..	63
⅜ in. to 1½ in., incl.	59.5
1⅝ in. and larger	58

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	65
1⅛ in. to 1½ in., incl.	62
1⅝ in. and larger..	58

CAP AND SET SCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter: ⅝ in. and smaller..	47
¾, ⅞ and 1 in. diam.	31
Longer than 6 in.: ⅝ in. and smaller..	18.5
¾, ⅞ and 1 in. diam.	5.5

High Carbon, Heat Treated:

6 in. and shorter: ⅝ in. and smaller..	34
¾, ⅞ and 1 in. diam.	13
Longer than 6 in.: ⅝ in. and smaller	+1
¾, ⅞ and 1 in. diam.	+19

Fillister Head, Coarse Thread: Listed Sizes ..... +31

Flat Head, Coarse Thread: ¼ in. and smaller by 6 in. and shorter.. +57

Set Screws, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.: 6 in. and shorter ..	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 10.85
$\frac{7}{16}$-in. under List less 26.5%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	23.56	22.84
1¼	13	....	27.92	22.68
1½	13	26.34	30.86	25.08
1¾	13	31.12	36.45	29.64
2	13	34.88	40.85	33.21
2¼	13	39.29	46.01	37.42
2½	12	42.64	49.94	40.61
2½	12	46.98	55.01	44.73
2¾	12	50.86	59.57	48.44
3	12	54.24	63.53	51.66

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.075	4.975	5.025	6.00
Ensley,Ala. T2	5.075	4.975	....	6.00
Fairfield, Ala. T2	....	....	....	6.00
Gary,Ind. U5	5.075	4.975	5.025	...
Huntington,W.Va. W7	....	....	....	6.15
IndianaHarbor,Ind. I-2	5.075	4.975	5.025	...
Johnstown,Pa. B2	....	....	....(16)	6.00
Lackawanna,N.Y. B2	5.075	4.975	....(16)	6.00
Minnequa,Colo. C10	5.075	4.975	....	6.50
Steelton,Pa. B2	5.075	4.975	....	...
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.025
Gary,Ind. U5	6.025
Ind.Harbor,Ind. I-2	6.025
Lackawanna,N.Y. B2	6.025
Minnequa,Colo. C10	6.025
Seattle B3	6.175
Steelton,Pa. B2	6.025
Torrance,Calif. C11	6.175

JOINT BARS

Bessmer,Pa. U5	6.35
Fairfield,Ala. T2	6.35
Ind.Harbor,Ind. I-2	6.35
Joliet,Ill. U5	6.35
Lackawanna,N.Y. B2	6.35
Minnequa,Colo. C10	6.35
Steelton,Pa. B2	6.35

AXLES

Ind.Harbor,Ind. S13	8.10
Johnstown,Pa. B2	8.10

TRACK BOLTS, Untreated

Cleveland R2	13.10
Lebanon,Pa. B2	13.10
Minnequa,Colo. C10	13.10
Pittsburgh P14	13.10
Seattle B3	13.60

SCREW SPIKES

Cleveland R2	12.85
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.775
Ind.Harbor,Ind. I-2, Y1	8.775
KansasCity,Mo. S5	8.775
Lebanon,Pa. B2	8.775
Minnequa,Colo. C10	8.775
Pittsburgh J5	8.775
Seattle B3	9.275
S.Chicago,Ill. R2	8.775
Struthers,O. Y1	8.775
Youngstown R2	8.775

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 5/16 in.; 6.23c; 1 15/16 to 8 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.143 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.00c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

YOUR GUIDE TO COLUMBIA DIE AND SHOCK STEEL GRADES

TYPE AND GRADES	DESCRIPTION	HARDENING RANGE	QUENCH	TEMPERING RANGE	USEFUL HARDNESS
D3 — SUPERDIE	High carbon, high chromium, high production, oil hardening type with maximum resistance to abrasion for highest production	1700° F. to 1750° F.	Oil or Salt Bath	400° F. to 1000° F.	65/55 Rc
D2 — ATMODIE **D2S — ATMODIE SMOOTHCUT**	Air hardening, high carbon, high chromium, non-deforming heavy duty long run die steel with better toughness — also available with smoothcutting additives	1800° F. to 1850° F.	Air	400° F. to 600° F.	62/58 Rc
A2S — E-Z-DIE SMOOTHCUT	Air hardening 5% chromium, deep hardening die steel with smoothcutting additives for maximum economy	1750° F. to 1825° F.	Air	400° F. to 600° F.	62/58 Rc
01 — EXL-DIE	Standard manganese chromium tungsten non-deforming oil hardening die steel for guages, plastic molds, jigs and fixtures	1450° F. to 1500° F.	Oil	350° F. to 450° F.	64/60 Rc
S1 — BUSTER ALLOY	Tungsten chromium oil hardening shock resisting steel for heavy duty dies and punches for cold and hot work available in .50% carbon for maximum shock resistance, .60% carbon for best cutting edge life	1650° F. to 1750° F.	Oil	400° F. to 800° F.	61/52 Rc
S5 — CEC SMOOTHCUT	Silicon manganese alloy steel plus smoothcutting additives for heavy punching, shearing and shock applications, also tool shanks	1550° F. to 1600° F. 1600° F. to 1650° F.	Water Oil	400° F. to 600° F. 400° F. to 600° F.	62/57 Rc 62/57 Rc

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILLINOIS

CENTRAL OFFICE AND WORKS, CHICAGO HEIGHTS, ILLINOIS — BRANCH STOCKS IN THE FOLLOWING CITIES:

1957

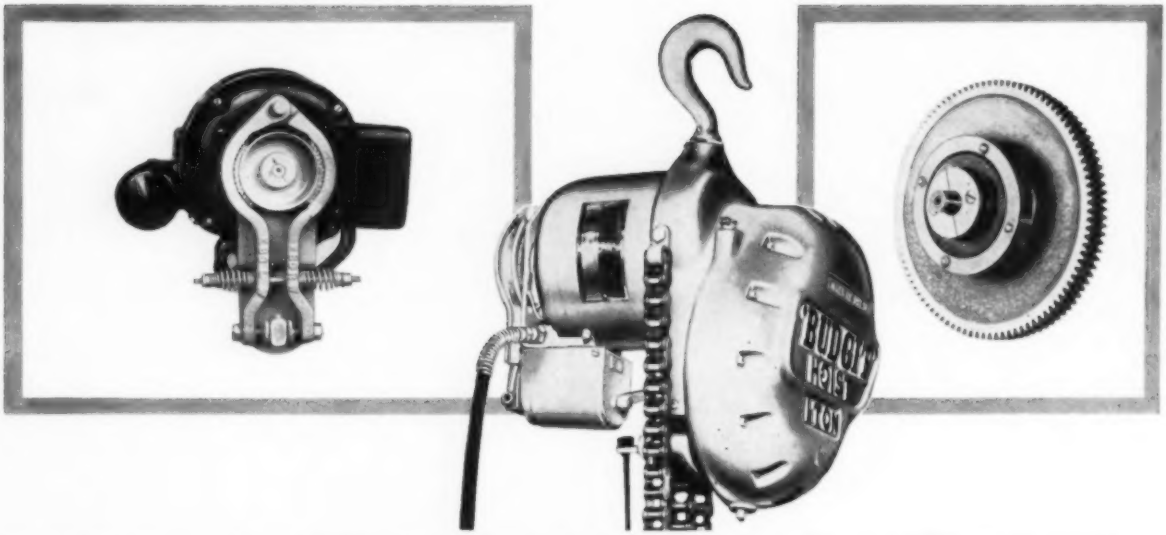
Chicago 32 — 4832 S. Kedzie Ave. — Phone LAfayette 3-3632
Cincinnati 25 — 2716 Spring Grove Ave. — Phone MUlberry 1-8400
Cleveland 14 — 1640 St. Clair Ave. — Phone MAin 1-1785
Detroit 3 — 121 Oakman Blvd. — Phone TUlsa 3-3770
Los Angeles 22 — 6955 E. Bandini Blvd. — Phone RAymond 3-4684
Milwaukee 4 — 426 S. Sixth St. — Phone BRoadway 6-0255
St. Louis 13 — 5118 Easton Ave. — Phone FOrest 1-0641

REPRESENTATIVES IN THE FOLLOWING CITIES: Dayton, Erie, Grand Rapids, Hartford, Indianapolis, Louisville, Moline, Newark, Portland and St. Paul

TOOL COLUMBIA STEELS

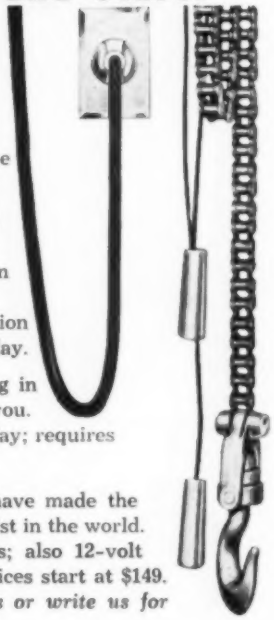
COLUMBIA TOOL STEELS

HIGH SPEED STEELS: Clarite — Vanite — Acmite — Cobite — Maxite — Molite Smoothcut Molite # 3 HOT WORK STEELS: Clarite HW — Formite # 3 — Formite # 2 — Molite HW10 — Vanadium Firedie — Alcodie — Firedie CARBON TOOL STEELS: Columbia Special — Vanadium Extra — Waterdie Extra — Columbia Extra — Columbia Extra Headerdie — Vanadium Standard — Columbia Standard



POWERFUL TWO-BRAKE HOIST

gives you greater SAFETY plus "hairline" stops and starts



The 'Budgit' Electrical Hoist has a motor brake and a load brake. They operate simultaneously, automatically. Each alone is strong enough to hold the full load safely. Braking action is so quick, load-spotting time is greatly reduced.

The 'Budgit' is easy to operate with one hand. The other hand is always free to guide the load. You get fast Hoisting. A 500-lb. load can be lifted 1 foot in less than 2 seconds. Less hoisting time means less idle time for production machines. More units can be processed per day.

Installation is no problem. Just hang up, plug in and the 'Budgit' is ready to work and save for you. It uses only a few cents' worth of electricity a day; requires very little maintenance.

Ruggedness, efficiency, safety and economy have made the 'Budgit' Electric Hoist the most widely used hoist in the world. Capacities: ⅛ to 2 tons. AC and DC models; also 12-volt battery-operated models for use on trucks. Prices start at $149. *Ask your "Shaw-Box" Distributor for details or write us for Bulletin 402.*

FOR GREATER CONVENIENCE, USEFULNESS

I-Beam Trolley adds travel-ability to any hoist. Bearing-equipped wheels roll smoothly. Fit various size I-beams. Capacities ¼-ton up. Priced from $19.50.

Chain Container collects 'Budgit' tail chain neatly—keeps it up out of the way. Holds up to 25 feet of chain. No drilling, no machining to install. Priced from $17.00.

'Budgit' Cord Reel. Keeps conductor cord taut. Cord may be led off in any direction. Useful on any hoist or other motor device up to 1 HP. 25 and 50 foot cords. Priced from $74.50.

57A-9

MAXWELL MANNING & MOORE INC. M&M TRADE MARK

'Budgit'® **ELECTRIC HOISTS**

MANNING, MAXWELL & MOORE, INC.

SHAW-BOX CRANE & HOIST DIVISION

384 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario.*

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2	2½	3	3½	4	5	6
List Per Ft.	37c	58.5c	76.5c	92c	$1.09	$1.48	$1.92
Pounds Per Ft	3.68	5.82	7.62	9.20	10.89	14.81	19.18

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Ambridge, Pa. N2	+2	....	4.5	....	7	....	8.5	....	8.5	....	8.25	....	10.75	....
Lorain, O. N3	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Youngstown Y1	0.5	+17.5	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Youngstown R2	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼	⅜	½	¾	⅝	1	1¼
List Per Ft	5.5c	6c	6c	8.5c	11.5c	17c	23c
Pounds Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Alton, Ill. L1	....	....	....	....	....	....	10.5	+3.75	13.5	+4.75	16	+1.25	18.5	0.5
Benwood, W. Va. W10	10	+20.5	+0.25	+27.75	+9.75	+37.25	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Butler, Pa. F6	10	+20.5	0.5	+27	+8.5	+36	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Fairless, Pa. N3	....	....	....	....	....	....	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Fontana, Calif. K1	....	....	....	....	....	....	+0.5	+19.75	2.5	+15.75	5	+12.5	7.5	+10.5
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	11.5	+7.75	14.5	+3.75	17	+0.25	19.5	1.5
Lorain, O. N3	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sharon, Pa. S4	11	+19.5	1.5	+26	+7.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sparrows Pt., Md. B2	9	+21.5	0.5	+28	+9.5	+37	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Wheatland, Pa. W9	11	+19.5	1.5	+26	+7.5	+35	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Youngstown R2, Y1	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5

Size—Inches	1½	2	2½	3	3½	4
List Per Ft	27.5c	37c	58.5c	76.5c	92c	$1.09
Pounds Per Ft	2.73	3.68	5.82	7.62	9.20	10.89

	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Alton, Ill. L1	19	1.5	19.5	2	21	2.75	21	2.75	....	....	....	....
Benwood, W. Va. W10	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+0.75	13.5	+5.25
Etna, Pa. N2	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Fairless, Pa. N3	19	1.5	19.5	2	21	2.75	21	2.75	11.5	+7.25	11.5	+7.25
Fontana, Calif. K1	8	+9.5	8.5	+9	10	+8.25	10	+8.25	0.5	+18.25	0.5	+18.25
Indiana Harbor, Ind. Y1	20	2.5	20.5	3	22	3.75	22	3.75	12.5	+6.25	12.5	+6.25
Lorain, O. N3	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sharon, Pa. M6	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sparrows Pt., Md. B2	19	1.5	19.5	2	21	2.75	21	2.75	11	+7.25	11	+7.25
Wheatland, Pa. W9	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Youngstown R2, Y1	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	....	....	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.25	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	....	27.75	36.25	....	40.25	42.50	44.25	53.75	53.75
446	....	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	33.25
304	33.15	36.20	40.30	44.50	35.25
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	52.25
316-L	43.55	47.60	52.70	57.85	....
316-Cb	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	42.00
347	37.05	41.25	46.45	51.70	51.00
405	27.55	29.20	33.15	37.05	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base—Cold Rolled—10%	Strip, Carbon Base—Cold Rolled—Both Sides
Copper*	34.40	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.043-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....		4.170
18.25	4.25	1	4.75	....		2.385
18	4	2	9	....		2.7575
18	4	2	....	....		1.845
18	4	1	....	....		1.680
9	3.5	..	....	....		1.275
13.5	4	3	....	....		1.945
13.75	3.75	2	5	....		2.325
6.4	4.5	1.9	....	5		1.185
6	4	3	....	6		1.430
1.5	4	1	....	8.5		1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	62.50	63.00	63.50	64.00
Tonawanda,N.Y. W12	62.50	63.00	63.50	64.00
N.Tonawanda,N.Y. T9	....	63.00	63.50	64.00
Boston, deld.	73.79	74.29	74.79	....
Rochester,N.Y., deld.	65.52	66.02	66.52	....
Syracuse,N.Y., deld.	66.62	67.12	67.62	....
Chicago District				
Chicago I-3	62.50	63.00	63.00	63.50
Gary,Ind. U5	62.50	....	63.00	....
S.Chicago,Ill. R2	62.50	....	63.00	....
S.Chicago,Ill. Y1	62.50	63.00	63.00	....
S.Chicago,Ill. U5	62.50	....	63.00	63.50
S.Chicago,Ill. W14	62.50	....	63.00	63.50
Milwaukee, deld.	64.96	65.46	65.46	65.96
Muskegon,Mich., deld.	....	76.53	76.53	....
Cleveland District				
Cleveland R2, A7	62.50	63.00	63.00	63.50
Akron,O., deld.	65.25	65.75	65.75	66.25
Mid-Atlantic District				
Birdsboro,Pa. B10	64.50	65.00	65.50	66.00
Chester,Pa. P4	64.50	65.00	65.50	....
Philadelphia, deld.	66.26	66.76	67.26	....
Swedeland,Pa. A3	64.50	65.00	65.50	66.00
New York, deld	....	71.20	71.70	....
Newark,N.J., deld.	68.52	69.02	69.52	70.02
Philadelphia, deld.	66.38	66.88	67.38	67.88
Troy,N.Y. R2	64.50	65.00	65.50	66.00
Pittsburgh District				
NevilleIsland,Pa. P6	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.95
McKeesRocks,Pa. deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding, Monaca,Pa., deld...	....	64.76	64.76	65.29
Verona, Trafford,Pa., deld	64.79	65.32	65.32	65.85
Brackenridge,Pa., deld.	65.10	65.60	65.60	66.13
Bessemer,Pa. U5	62.50	....	63.00	63.50
Clairton,Rankin,S.Duquesne,Pa. U5	62.50	....	....	....
Midland,Pa. C18	62.50	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	63.00	....
Sharpsville,Pa. S6	62.50	....	63.00	63.50
Youngstown Y1	....	....	63.00	63.50
Mansfield,O., deld.	67.40	....	67.90	68.40
Duluth I-3	62.50	63.00	63.00	63.50
Erie,Pa. I-3	62.50	63.00	63.00	63.50
Everett,Mass. E1	64.50	65.00	65.50	....
Fontana,Calif. K1	*70.50*	*71.00*	....	....
Geneva,Utah C11	62.50	63.00	....	....
GraniteCity,Ill. G4	64.40	64.90	65.40	....
Ironton,Utah C11	62.50	63.00	....	....
LoneStar,Tex. L6	58.50*	59.00†	....	....
Minnequa,Colo. C10	64.50	65.00	65.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	62.50	63.00	63.00	63.50
Cincinnati, deld.	68.26	68.76	....	....

*Phos. 0.51-0.75%; Phos. 0.31-0.50%, $59.50.
†Phos. 0.51-0.75%; Phos. 0.31-0.50%, $60.
‡Phos. 0.70-0.90%; intermediate (Phos. 0.31-0.69%), $60.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	71.50
Buffalo H1	72.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$105.50
NiagaraFalls,N.Y. P15	*105.50*
Keokuk,Iowa, Open-hearth & Fdry, freight allowed K2	110.00
Keokuk, O.H. & Fdry, 12¼ lb piglets, 16% Si, frgt allowed K2	113.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$76.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	76.50
Troy,N.Y. R2 (Phos. 0.035% max)	70.50
Philadelphia, deld.	78.28
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, Spokane, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS				Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.§	H.R. Alloy 4140††	Structural Shapes	Carbon	Floor
Atlanta	8.07‖	9.27‖	9.83‖	....	8.16	8.30	...	10.14	....	8.44	8.40	10.22
Baltimore	7.79	8.99	9.12	....	8.27	8.34	8.87	9.09§	15.69	8.57	8.12	10.81
Birmingham	7.68‖	8.88‖	8.85‖	....	7.78	7.91	8.44	10.04	....	8.05	8.01	10.04
Boston	8.70	9.73	11.02	....	8.79	8.88	9.43	10.71	14.46	8.90	8.98	10.39
Buffalo	7.75	8.90	10.72	....	8.00	8.00	8.70	8.70	14.30	8.25	8.25	9.80
Chattanooga	7.90‖	9.10‖	9.10‖	....	8.00	8.13	8.66	9.96	....	8.27	8.23	9.98
Chicago	7.80	8.90	9.70	....	7.82	7.91	8.44	8.35	13.95	8.20	8.16	9.26
Cincinnati	7.82	8.89	9.75	....	8.06	8.19	8.72	8.82	14.23	8.55	8.34	9.53
Cleveland	7.68	8.88	9.60	....	7.88	7.99	8.52	8.60	14.03	8.38	8.21	9.46
Denver	9.55	11.09	12.41	....	9.70	9.75	...	10.54	18.89	9.60	9.50	11.15
Detroit	7.91	9.13	10.02	....	8.10	8.18	8.71	8.68	14.19	8.55	8.33	9.49
Erie, Pa.	7.75	8.88	9.60¹⁰	....	7.90	8.00	8.65	8.70¹⁰	....	8.35	8.20	9.50
Houston	8.70	9.65	10.99	....	8.80	8.95	9.50	10.55	15.00	8.90	8.60	10.10
Jackson, Miss.	8.00‖	9.20‖	9.22‖	....	8.10	8.23	8.76	10.14	....	8.37	8.33	10.08
Los Angeles	8.90	10.65	11.65	....	9.10	8.80	9.50	11.70	15.25	8.95	9.35	11.50
Milwaukee	7.93	9.02	9.82	....	7.95	8.03	8.56	8.57	14.07	8.41	8.29	9.38
Moline, Ill.	8.05	9.25	10.05	....	8.13	8.26	...	8.70	....	7.78	8.36	...
New York	8.35	9.53	10.23	57.73	8.81	8.53	9.38	10.61	14.37	8.74	8.78	10.65
Norfolk, Va.	7.85	...	...	....	8.30	8.35	...	10.80	....	8.60	8.10	9.60
Philadelphia	8.15	9.08	10.12	....	8.81	8.55	9.08	9.12	14.31	8.70	8.68	9.70
Pittsburgh	7.68	8.88	10.05	50.00	7.88	7.91	8.44	8.60	13.95	8.05	8.01	9.26
Portland, Oreg.	8.90	9.65	11.40	....	9.05	8.95	...	13.55	14.60	8.90	8.70	11.60
Richmond, Va.	8.05	...	10.09	....	8.45	8.70	9.20	10.00	...	8.80	8.35	9.70
St. Louis	8.14	9.21	10.03	....	8.19	8.25	8.78	8.93	14.28	8.67	8.52	9.59
St. Paul	8.29	9.49	10.31	....	8.39	8.52	...	9.21	....	8.75	8.71	9.87
San Francisco	8.75	10.30	10.80	....	8.95	8.80	9.35	12.30	15.25	8.85	8.85	11.15
Seattle	9.35	10.45	11.55	....	9.50	9.30	9.85	13.15	15.55	9.15	9.05	11.25
Spokane, Wash.	9.35	10.50	11.55	....	9.50	9.30	9.85	13.15	16.30	9.15	9.05	11.25
Washington	8.37	10.57	...	....	9.06	8.92	...	9.67	....	9.15	8.70	10.14

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; **¼-in. and heavier; ††as annealed; §42 in. and under.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ⁸—400 to 999 lb; ⁹—1000 to 1999 lb; ¹—2000 to 3999 lb; ¹⁰—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $165; Stevens Pottery, Ga., $175.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $223; Philadelphia, Clearfield, Pa., $280.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $278; Philadelphia, Clearfield, Pa., $285.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $318; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $177; Clearfield, Pa., $189.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $292; Clearfield, Pa., $311.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $236.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅛-in. grains with fines: Chewelah, Wash., Luning, Nev. $43; ⅝-in. grains with fines: Baltimore, $69.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom. 24.00-25.00
Brazilian iron ore, 68-69%	33.00-34.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$28.50-29.00
Domestic, concentrates, mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account; other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$54.00-57.00
48% 2.8:1	51.00-54.00
48% no ratio	42.00-45.00

South African Transvaal

48% no ratio	$37.50-39.00
44% no ratio	26.00-27.00

Turkish

48% 3:1	$60.00-63.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.35-3.80
60-65%	3.80-3.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
Swedish, c.i.f. Camden, N.J., c.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N.J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ¼ in. x 1.3 in.	26.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, $6.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb. drum, frght allowed	
Carlots	36.20
Ton lots	38.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	36.80-46.80†
Bronze, 5000-lb lots	56.20-60.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.05
Nickel-Silver, 5000-lb lots	55.10-58.40†
Phosphor-Copper, 5000-lb lots	85.00
Copper (atomized) 5000-lb lots	48.50-56.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.05
Stainless Steel, 316	$1.40
Tin	14.50*
Zinc, 5000-lb lots	19.75-33.00‡
Tungsten: Dollars	
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.20
Less than 1000 lb	4.35
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam. (Inches)	Length (Inches)	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5⅛	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.50
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$27.60
Cincinnati, deld.	32.53
Buffalo, ovens	29.50
Camden, N. J., ovens	*29.50*
Detroit, ovens	29.50
Pontiac, deld.	31.15
Saginaw, deld.	32.73
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	30.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	28.00
Cincinnati, deld.	28.25
Kearny, N.J., ovens	*30.00*
Lone Star, Tex., ovens	25.50
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.55
Philadelphia, ovens	*29.50*
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	28.25
St. Paul, ovens	29.75
Chicago, deld.	33.14
Swedeland, Pa., ovens	*29.50*
Terre Haute, Ind., ovens	29.75

*Or within $4.55 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.40	$7.40	$7.40	$7.65
Bar Size Angles	7.11	7.11	7.11	7.26
Structural Angles	7.40	7.40	7.40	7.70
I-Beams	7.75	7.75	7.75	8.15
Plates	9.50	9.50	9.50	10.00
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	27.02	27.02	27.02	27.49
Barbed Wire (†)	6.61	6.61	6.61	6.96
Merchant Bars	7.15	7.15	7.15	7.50
Hot-Rolled Bands	7.25	7.25	7.25	7.65
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (§)	7.90	7.90	7.90	8.02

Oil Country Pipe: Mills withdrawn for remainder of the year.

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	38.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn. 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa., Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 33c; 2000 lb to min carload, 35c; 500 lb to 1999 lb, 37c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 13.8c per lb of alloy. Packed, c.l. 15c, ton 15.45c, less ton 16.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lot 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13.9c per lb of contained Si. Packed c.l. 16.4c, ton lot 17.85c, less ton 19.5c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per pound contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb. f.o.b. Suspension Bridge, N. Y.. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c, less ton 18.1c. Delivered. Add 0.25 for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3⅛ lb and containing 2 lb of Mn and approx ⅛ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c. 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 00.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet, packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $3.15 per lb of contained W; 2000 lb W to 5000 lb W, $3.25; less than 2000 lb W, $3.37. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.95 per lb of contained Cb plus Ta, delivered; less ton lot $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

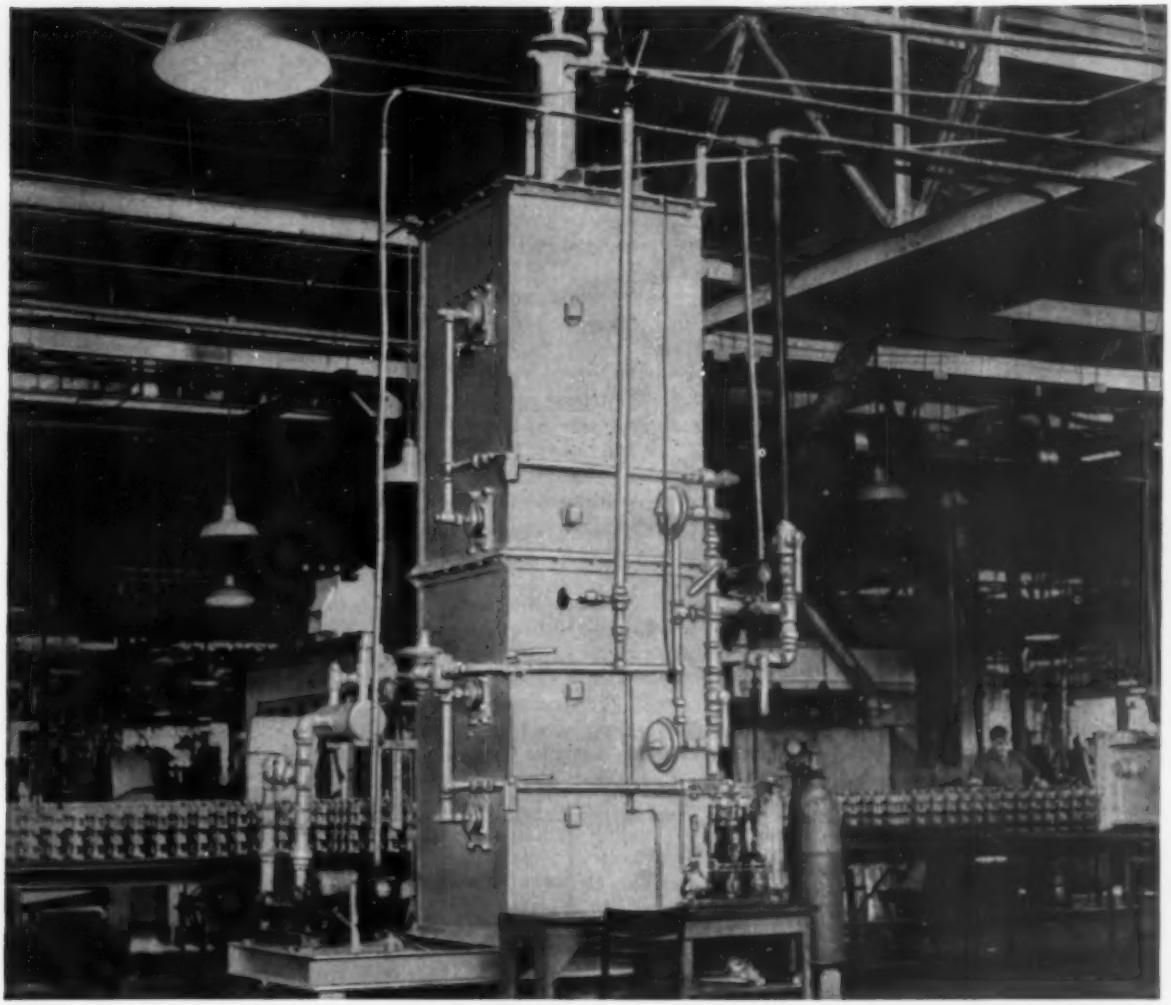
V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.



1,500,000 cfh of atmosphere

That's the combined capacity of all the Surface RX® gas generators sold since this first one started operating April 4, 1941. This was the first practical catalytic gas generator for continuous bright gas carburizing . . . and it's still in use at Warner Gear Division, Borg-Warner Corp.

Such long-term reliability is only one of the reasons why so many plants standardize on Surface gas generators. Controllability, flexibility, turn-down operation, variety of gases and capacities are some of the other reasons. We'll be happy to tell you more about them.

SEND FOR BULLETIN SC-155 • SURFACE COMBUSTION CORPORATION • 2385 DORR ST., TOLEDO 1, OHIO

Surface® Heat Treat, Steel Mill, Glass Divisions • Kathabar® Air Conditioning Division • Janitrol® Aircraft-Automotive Division • Janitrol® Heating & Air Conditioning Division • Webster Engineering Company: Boiler Burner Division

Surface®
HEAT TREATING EQUIPMENT

Scrap Prices Continue To Decline

Composite on the steelmaking grades off another dollar per ton to $59.83. Current mill buying limited with substantial tonnages of industrial material coming out

Scrap Prices, Page 128

Chicago—A few steel grades are off $1 to $2 a ton in light purchases. No. 1 heavy melting of industrial origin and No. 1 factory bundles sold for $1 less than previously while No. 1 dealer bundles and rerolling rails took a $2 dip. Prices of other grades are holding in a weak market.

Some observers feel the selling off forecasts lower steelmaking operations later this year, while others attribute it to a leveling off of a market that edged too high.

Philadelphia — Steel scrap has undergone a further sharp decline. The prime open-hearth grades are off $2 a ton, with No. 1 heavy melting, No. 1 bundles and No. 1 busheling holding at $59, delivered. Prices on No. 2 heavy melting have dropped $3, to $51, delivered, and No. 2 bundles similarly, to $49.

Other steel grades have declined moderately, except for couplers, springs and wheels which are up $1 to $73, delivered. Cast scrap is strong and unchanged.

Some trade interests believe the present readjustment has about run its course. Dealers' stocks are light and collections are being hampered by winter weather. Also, some accumulations are still going for export.

Electric furnace bundles are lower at $63, delivered, mixed borings and turnings at $54, machine shop turnings, $43, short shoveling turnings, $47, and heavy turnings, $55. Low phos structurals and plates are off $2 a ton to $64-$66, delivered. Rail crops, 2-ft and under, are easier at $80-$82, delivered.

Boston — Heavy melting steel grades are giving ground grudgingly. Heavier buying by a leading district consumer is at a price level somewhat above that paid shipping point for other districts, $51.50 by brokers for No. 1 heavy melting, $43 for No. 2 heavy melting and $52.50 for busheling. Machine shop and short shoveling turnings are off $1 a ton. Bad weather is slowing shipments.

New York — General easing in steel scrap is reflected here in lower brokers' buying prices on prime open-hearth material and several other steel grades. While still offering unchanged prices for No. 2 heavy melting, brokers have dropped offerings for No. 1 heavy melting and No. 1 bundles to $55-$56, and for No. 2 bundles to $45-$46. They have lowered prices for machine shop turnings to $35-$35.50, mixed borings and turnings to $36-$37, short shoveling turnings to $39-$40 and low phos

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, Inc., 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

HOT DIP GALVANIZING
JOSEPH P. CATTIE & BROTHERS, INC.
2520 East Hagert Street
Phone: Re-9-8911 Philadelphia 25, Pa.

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

MODERN ELECTROPLATING
583 PAGES ILLUSTRATED
Price $8.50 Postpaid
BY ALLEN G. GRAY, Technical Editor, STEEL Magazine.
Brings you a complete, up-to-date one-volume summary of current industrial electroplating processes. The only book that emphasizes both practical aspects and basic theory. The Penton Publishing Company, Book Department, 1213 West Third St., Cleveland 13, Ohio.

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

structural and plate to $58-$59. Cast grades and stainless steel specialties are unchanged.

Pittsburgh — Scrap prices continue to decline. Uncertainty over second quarter steel operating rates is reflected in lack of large mill orders for scrap.

With no representative No. 1 heavy melting orders reported the last week, the price on that grade is unchanged, but sharp drops occurred in cut structurals, electric furnace bundles and in railroad scrap. Latest No. 1 railroad heavy melting price was $65, down $7 from the previous level. Rails dropped an average of $2 a ton.

Cleveland — The steelmaking grades of scrap are holding unchanged in the face of sluggish demand. Tonnage is moving on old orders but there is little new buying. The same situation prevails in the cast iron grades. Substantial tonnages of production scrap are coming out but dealer scrap is not too plentiful because of slower collections and curtailed yard operations attending winter weather.

Youngstown—Scrap shows signs of weakening, reflecting declines at other consuming points. Some holders think the market will not go down much because of the high level of steelmaking operations currently. One large mill bought No. 2 heavy melting at $57, down $2 from its previous purchase.

Buffalo—The local market undertone is softer but consumer prices do not reflect any price reductions. Going prices are likely to prevail until current orders on dealers' books are pretty well cleared away. It is generally agreed dealers could not get existing prices on new orders.

Detroit — The market continues in a slump here. Brokers are not buying at present.

St. Louis — Prices are little changed in the current dull market. Clean auto cast is off 50 cents a ton, stove plate $1 a ton.

Cincinnati—Prices are firm following the recent "correction" of a market that "went too high." That's the view of brokers here who are offering $59-$60 for No. 1 heavy melting.

Birmingham — With the area's largest buyer of heavy melting out of the market, there is no activity in those grades. Electric furnace scrap is softer and lower prices are quoted on specialties.

Seattle—Steel scrap prices are firm at $56 and $53, respectively, for No. 1 and No. 2 heavy melting steel. Receipts continue heavy.

San Francisco—Prices on top grades of steel scrap have risen $3 a ton.

Los Angeles—While prices are steady, the market undertone is being affected by offshore scrap.

Rails, Cars . . .

Track Material Prices, Page 118

The Pennsylvania Railroad last week placed a $1.5 million order for six new type commuter coaches developed by the Budd Co., Philadelphia. The Pennsy also took an option on 44 more, the total cost of the 50 cars to be approximately $9 million. Delivery of the first six is scheduled for next December.

Pig Iron . . .

Pig Iron Prices, Page 122

Kaiser Steel Corp., Oakland, Calif., raised prices 50 cents a gross ton on pig iron to the basis of $70.50, furnace, for basic and $71 for No. 2 foundry. The increase went into effect Jan. 11.

Kaiser's three blast furnaces at Fontanta, Calif., last year produced 1,410,737 tons of pig iron, operating at 107 per cent of rated capacity.

U.S. Steel Corp.'s Columbia-Geneva Steel Division has brought back into production its No. 1 blast furnace. It was down 46 days for a major repair job.

Merchant pig iron supply is adequate, but not overly plentiful. In the Mid-Atlantic district, consumption by foundries has picked up since the turn of the year. In some of the other major consuming districts, foundry operations have not improved as much as had been expected.

Alan Wood Steel Co. has been out of the market this month due to repairs to its larger stack at Swedeland, Pa. However, this furnace is expected to resume operations soon.

Bethlehem Steel Co.'s permanent withdrawal from the merchant pig iron market Jan. 1 has been felt to some extent. But the firm's customers were warned well in advance. Adjustments have been made without much difficulty.

Iron Ore . . .

Iron Ore Prices, Page 123

Several new shipping records were chalked up for Great Lakes

(*Please turn to page* 133)

Owner-management makes you *feel* like a V.I.P. every time you come to Baltimore. Teletype: BA263.

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 16	$59.83
Jan. 9	60.83
Dec. Avg.	64.29
Jan. 1956	52.17
Jan. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	62.00-63.00
No. 2 heavy melting	55.00-56.00
No. 1 bundles	62.00-63.00
No. 2 bundles	49.00-50.00
No. 1 busheling	62.00-63.00
Machine shop turnings	*41.00-42.00*
Mixed borings, turnings	*41.00-42.00*
Short shovel turnings	46.00-47.00
Cast iron borings	46.00-47.00
Cut structurals, 3 ft. lengths	*69.00-70.00*
Heavy turnings	57.00-58.00
Punchings & plate scrap	*69.00-70.00*
Electric furnace bundles	*69.00-70.00*

Cast Iron Grades

No. 1 cupola	*53.00-54.00*
Heavy breakable cast	50.00-51.00
Unstripped motor blocks	40.00-41.00
No. 1 machinery cast	60.00-61.00

Railroad Scrap

No. 1 R.R. heavy melt.	*64.00-65.00*
Rails, 2 ft and under	*79.00-80.00*
Rails, 18 in. and under	*80.00-81.00*
Rails, random lengths	*77.00-78.00*
Railroad specialties	*71.00-72.00*

Stainless Steel Scrap

18-8 bundles & solids	480.00-520.00
18-8 turnings	400.00-420.00
430 bundles & solids	110.00-120.00
430- turnings	80.00-85.00

CLEVELAND

No. 1 heavy melting	60.00-61.00
No. 2 heavy melting	51.00-52.00
No. 1 bundles	60.00-61.00
No. 2 bundles	44.00-45.00
No. 1 busheling	60.00-61.00
Machine shop turnings	35.00-36.00
Mixed borings, turnings	38.00-39.00
Short shovel turnings	38.00-39.00
Cast iron borings	38.00-39.00
Cut foundry steel	58.00-59.00
Low phos.	64.00-65.00
Cut structural plates 2 ft and under	*67.00-68.00*
Alloy free, short shovel turnings	43.00-44.00
Electric furnace bundles	61.00-62.00

Cast Iron Grades

No. 1 cupola	57.00-58.00
Charging box cast	49.00-50.00
Heavy breakable cast	47.00-48.00
Stove plate	53.00-54.00
Unstripped motor blocks	38.00-39.00
Brake shoes	47.00-48.00
Clean auto cast	*55.00-56.00*
Burnt cast	44.00-45.00
Drop broken machinery	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	*64.00-65.00*
R.R. malleable	*66.00-67.00*
Rails, 2 ft and under	*81.00-82.00*
Rails, 18 in. and under	*82.00-83.00*
Rails, random lengths	*76.00-77.00*
Cast steel	*69.00-70.00*
Railroad specialties	*72.00-73.00*
Uncut tires	*71.00-72.00*
Angles, splice bars	*72.00-73.00*
Rails, rerolling	*83.00-84.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	450.00-500.00
18-8 turnings	300.00-310.00
430 clips, bundles, solids	*110.00-115.00*
430 turnings	*55.00-60.00*

YOUNGSTOWN

No. 1 heavy melting	63.00-64.00
No. 2 heavy melting	*55.00-56.00*
No. 1 bundles	63.00-64.00
No. 2 bundles	*47.00-48.00*
No. 1 busheling	63.00-64.00
Machine shop turnings	36.00-37.00
Short shovel turnings	43.00-44.00
Cast iron borings	43.00-44.00
Low phos.	67.00-68.00
Electric furnace bundles	64.00-65.00

Railroad Scrap

No. 1 R.R. heavy melt.	*65.00-66.00*

CHICAGO

No. 1 heavy melting	*56.00-60.00*
No. 2 heavy melting	47.00-48.00
No. 1 factory bundles	*62.00-64.00*
No. 1 dealer bundles	*56.00-57.00*
No. 2 bundles	45.00-46.00
No. 1 busheling	*56.00-60.00*
Machine shop turnings	37.00-38.00
Mixed borings, turnings	39.00-40.00
Short shovel turnings	39.00-40.00
Cast iron borings	39.00-40.00
Cut structurals, 3 ft	66.00-67.00
Punchings & plate scrap	67.00-68.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	46.00-47.00
Unstripped motor blocks	39.00-40.00
Clean auto cast	55.00-56.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*61.00-62.00*
R.R. malleable	68.00-69.00
Rails, 2 ft and under	82.00-83.00
Rails, 18 in. and under	83.00-84.00
Angles, splice bars	71.00-72.00
Rails, rerolling	*82.00-83.00*

Stainless Steel Scrap

18-8 bundles & solids	505.00-515.00
18-8 turnings	355.00-375.00
430 bundles & solids	105.00-110.00
430 turnings	60.00-65.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*51.00-52.00*
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*52.00-53.00*
No. 2 bundles	*39.00-40.00*
No. 1 busheling	*51.00-52.00*
Machine shop turnings	*29.00-30.00*
Mixed borings, turnings	*31.00-32.00*
Short shovel turnings	*32.00-33.00*
Punchings & plate scrap	*63.00-64.00*

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	44.00
Stove plate	45.00
Heavy breakable	44.00
Unstripped motor blocks	32.00
Clean auto cast	55.00
Malleable	56.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	51.00
No. 2 heavy melting	48.50
No. 1 bundles	51.00
No. 2 bundles	42.50
No. 1 busheling	51.00
Machine shop turnings	36.00
Short shovel turnings	*39.00*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	44.00
Heavy breakable cast	44.00
Unstripped motor blocks	42.50
Brake shoes	51.00
Clean auto cast	*52.50*
Stove plate	*42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	66.00
Rails, 18 in. and under	83.00
Rails, rerolling	83.00
Rails, random lengths	78.50
Angles, splice bars	70.00

PHILADELPHIA

No. 1 heavy melting	*59.00*
No. 2 heavy melting	*51.00*
No. 1 bundles	*59.00*
No. 2 bundles	*49.00*
No. 1 busheling	*59.00*
Electric furnace bundles	*63.00*
Mixed borings, turnings	45.00
Machine shop turnings	*43.00*
Short shovel turnings	*47.00*
Heavy turnings	*55.00*
Structurals & plates	*64.00-66.00*
Couplers, springs, wheels	*73.00*
Rails, crops, 2 ft & under	*80.00-82.00*

Cast Iron Grades

No. 1 cupola	54.00-56.00
Malleable	67.00-68.00†
Heavy breakable cast	59.00
Drop broken machinery	60.00-61.00

†Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*55.00-56.00*
No. 2 heavy melting	47.00-48.00
No. 1 bundles	*55.00-56.00*
No. 2 bundles	*45.00-46.00*
Machine shop turnings	*35.00-35.50*
Mixed borings, turnings	*36.00-37.00*
Short shovel turnings	*39.00-40.00*
Low phos. (structural & plate)	*58.00-59.00*

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	50.50-51.50

Stainless Steel

18-8 sheets, clips, solids	475.00-485.00
18-8 borings, turnings	345.00-370.00
430 sheets, clips, solids	110.00-115.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*50.00-51.50*
No. 2 heavy melting	*42.50-43.00*
No. 1 bundles	*50.00-51.50*
No. 2 bundles	*39.50-40.00*
No. 1 busheling	*51.00-52.50*
Machine shop turnings	*32.00-33.00*
Mixed borings, turnings	34.00-34.50
Short shovel turnings	*36.50-37.00*
No. 1 cast	44.50-45.50
Mixed cupola cast	42.00-43.00
No. 1 machinery cast	45.00-46.00

BUFFALO

No. 1 heavy melting	61.00-62.00
No. 2 heavy melting	52.00-53.00
No. 1 bundles	61.00-62.00
No. 2 bundles	48.00-49.00
No. 1 busheling	61.00-62.00
Mixed borings, turnings	38.00-39.00
Machine shop turnings	39.00-40.00
Short shovel turnings	43.00-44.00
Cast iron borings	34.00-35.00
Low phos.	65.00-66.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	49.00-50.00
No. 1 machinery	54.00-55.00

Railroad Scrap

Rails, random lengths	69.00-70.00
Rails, 3 ft and under	75.00-76.00
Railroad specialties	68.00-69.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	59.00-60.00
No. 2 heavy melting	*49.00-50.00*
No. 1 bundles	59.00-60.00
No. 2 bundles	43.00-44.00
No. 1 busheling	59.00-60.00
Machine shop turnings	39.50-40.50
Mixed borings, turnings	37.50-38.50
Short shovel turnings	42.50-43.50
Cast iron borings	37.50-38.00
Low phos. 18 in.	*65.00-66.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable cast	46.00-47.00
Charging box cast	47.00-48.00
Drop broken machinery	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt.	60.00-61.00
Rails, 18 in. and under	79.00-80.00
Rails, random lengths	71.00-72.00

BIRMINGHAM

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	44.00-45.00
No. 1 bundles	46.00-47.00
No. 2 bundles	38.00-39.00
No. 1 busheling	46.00-47.00
Cast iron borings	27.00-28.00
Short shovel turnings	*38.00-39.00*
Machine shop turnings	*37.00-38.00*
Bar crops and plate	*62.00-63.00*
Structurals & plate, 2 ft	*60.00-61.00*
Electric furnace bundles	*54.00-55.00*
Cut foundry steel	*52.00-53.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*53.00-54.00*
Stove plate	51.00-52.00
Unstripped motor blocks	44.00-45.00
Charging box cast	40.00-41.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	61.00-62.00
Rails, 18-in. and under	74.00-75.00
Rails, rerolling	*78.00-79.00*
Rails, random lengths	*68.00-69.00*
Angles, splice bars	66.00-67.00

SEATTLE

No. 1 heavy melting	56.00
No. 2 heavy melting	53.00
No. 1 bundles	53.00
No. 2 bundles	33.00-35.00
Machine shop turnings	30.00-33.00
Mixed borings, turnings	30.00-33.00
Electric furnace No. 1	62.00-65.00

Cast Iron Grades

No. 1 cupola	54.00-56.00
Heavy breakable cast	48.00-50.00
Unstripped motor blocks	48.00-49.00
Stove plate (f.o.b. plant)	42.00-43.00

LOS ANGELES

No. 1 heavy melting	54.00
No. 2 heavy melting	52.00
No. 1 bundles	53.00
No. 2 bundles	40.00
Machine shop turnings	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	58.00

SAN FRANCISCO

No. 1 heavy melting	*59.00*
No. 2 heavy melting	*57.00*
No. 1 bundles	*58.00*
No. 2 bundles	44.00
Machine shop turnings	38.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Heavy turnings	38.00
Short shovel turnings	*40.00*
Cut structurals	*63.00*

Cast Iron Grades

No. 1 cupola	60.00
Charging box cast	47.00-49.00
Stove plate	48.00
Heavy breakable cast	42.00
Unstripped motor blocks	50.00
Clean auto cast	60.00
No. 1 wheels	50.00
Drop broken machinery	62.00

HAMILTON, ONT.

No. 1 heavy melting	54.00
No. 2 heavy melting	47.00
No. 1 bundles	54.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Busheling, new factory: Prepared	52.00
Unprepared	48.00
Short steel turnings	35.00

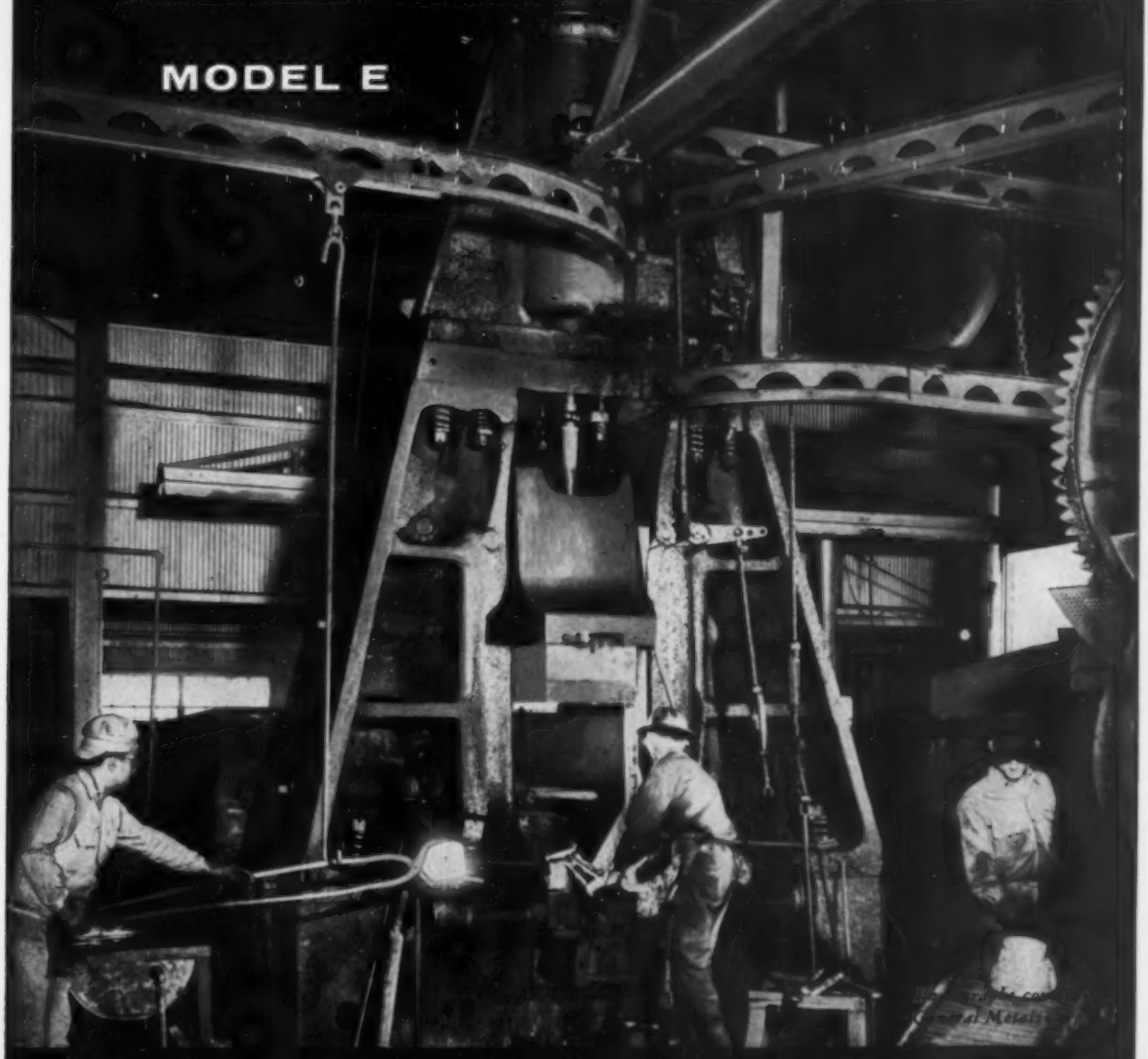
Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., Hamilton, Ont.

CHAMBERSBURG
STEAM DROP HAMMERS

MODEL E



MODERN FORGING REQUIREMENTS DEMAND MODERN HAMMERS ·

Shown above is a 6000 lb. Model "E" Chambersburg Steam Drop Hammer forging 4" alloy steel valve bodies. A Chambersburg 200 ton Steel Side Trimming Press is used to complete the operation. The Chambersburg Model "E" Hammer pays its way through increased production and trouble-free service. Details of this modern hammer are in our Bulletin No. 55-L-4. If interested, write for a copy.

Trimming Forgings on Chambersburg Trimmer

CHAMBERSBURG ENGINEERING COMPANY · CHAMBERSBURG, PA.

More Nickel Available?

Stockpile deferrals may mean nothing. The U.S. must establish a more flexible distribution program before metalworking companies can even accept extra amounts being offered

Nonferrous Metal Prices, Pages 132 & 133

WITH INDICATIONS that the government will defer first half nickel stockpile deliveries, a growing question is what will become of the U.S. Nicaro production?

Metallic nickel from Nicaro is selling for the primary market price of 74 cents a pound. Sinter and powder are cheaper.

Under a government-sanctioned distribution program, metalworking plants are allowed only a specific portion of market price nickel. They may, however, buy as much premium price nickel as they can get.

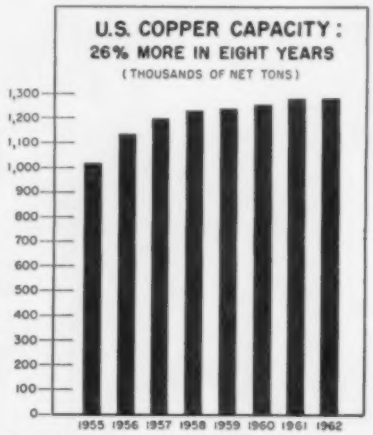
The Nicaro nickel diverted from government stockpile may have to be refused by nickel users if it would run them over their allotments of market price material.

If industry must refuse critically needed nickel, it may mean that the unused share of the Nicaro production will find its way back into stockpile. Flexibility in the distribution program will be a must in the coming months if industry is to benefit.

While obtaining additional amounts of market price nickel is a problem, premium price merchants are flourishing. Nickel Rim Mines Ltd. has contracted for sale of 1050 tons of nickel to be delivered in the next year at an average of $2 a pound. Another small Canadian producer is offering a ten-year contract—five years at $1 a pound, five years at the world market price.

Brokers Beware

Wah Chang Corp.'s decision to produce tin alloys may have a decided effect on the American tin market. By purchasing the U.S. Texas City tin smelter, it will be able to buy the same ores, concentrates and residues that the smelter utilized when it was operated by the government. With freight costs lower (it will be in competition with Straits and Singapore tins), look for Wah Chang to go all out to become a leading supplier of U.S. tin. Brokers, who have historically increased the price as much as possible on an upswing in demand and reduced prices as little as possible when demand slides, may find American companies eager to deal with an American source for tin alloys.



Source: Copper and Brass Research Association.

Foreign Imports Grow

The copper industry is feeling the effect of imports of copper tubing, roofing materials and brass and copper sheets. Some of the imported materials are selling anywhere from 17 to 19 per cent below domestic quotations. It is estimated that imported mill products may account for some 5 per cent of total brass mill sales in the U.S.

Aluminum Average Up

The average 1957 automobile will use 38.1 lb of aluminum, estimates Aluminum Co. of America. Last year's models used an estimated 34.6 lb. Depending on who comes out as the leading producers in 1957, Alcoa's estimates could be conservative. Some higher-priced models are using from 129 to 255 lb per car. (Examples: Cadillac Eldorado, 199 lb; Chrysler Imperial, 129 lb.)

Lead, Zinc: More Barter

The U.S. has re-entered the market for lead and zinc of foreign origin. It will trade perishable foodstuffs for the two metals. This gives American producers assurance that the U.S. intends to keep draining excess lead and zinc from foreign markets during 1957.

Market Memos

- Look for the government to start stockpiling copper if the market drops to 31 cents a pound.
- International Nickel Co. Inc. reports that free world nickel production reached a record high in 1956—about 225,000 tons. During 1955, some 213,500 tons were produced.

NONFERROUS PRICE RECORD

	Price Jan. 16	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan., 1956 Avg.
Aluminum ..	27.10	Aug. 10, 1956	25.90	27.100	27.100	24.400
Copper	35.00–36.00	Dec. 19, 1956	35.50–36.00	35.650	35.956	46.700
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	15.960
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	32.500
Nickel	74.00	Dec. 6, 1956	64.50	70.880	64.500	64.500
Tin	102.125	Jan. 16, 1957	102.25	104.465	111.049	105.067
Zinc	13.50	Jan. 6, 1956	13.50	13.500	13.500	13.440

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

Checklist for buyers of business planes

New executive transports, new features, new performance; put them together, and they call for an entirely new set of standards before you decide.

		YES	NO
1	Is the aircraft propjet-powered—for performance, freedom from vibration?	☐	☐
2	Is the cabin pressurized and airconditioned—for comfort, for personal safety?	☐	☐
3	Is the cruising speed on a par with contemporary airliners?	☐	☐
4	Can it fly more than 2,000 miles without refueling?	☐	☐
5	Can it land and take off on small town airfields, with single runways less than 4,000 ft. in length?	☐	☐
6	Can it double as a high-priority cargo carrier, with a capacity of more than two tons?	☐	☐
7	Can it climb to 19,000 feet on *one* engine?	☐	☐
8	Does it have room for conferences and work-en-route?	☐	☐

If the airplane you are currently considering rates even one "No" on this list, you may be settling for the second-best; if you've checked off all the "Yes" boxes, you have the Fairchild F-27 in mind—there is no other plane like it.

Address inquiries to: R. James Pfeiffer, Executive Director of Customer Relations, Fairchild Engine and Airplane Corporation, Hagerstown 15, Md.

FAIRCHILD

F-27 *Friendship*

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 13, 28.90; No. 43, 28.70; 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb. f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.
Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 36.00 deld. Conn. valley; 36.00 deld. Midwest; custom smelters, 35.00 deld.; lake, 36.00 deld.; fire refined, 35.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.
Indium: 99.9%, $2.25 per troy oz.
Iridium: $90-$110 nom. per troy oz.
Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00, f.o.b. Velasco, Tex. 13 in. sticks, 59.00, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$106 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot, 102.125; prompt, 101.875.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $2.75; grade A-2 (0.5% Fe max), $2.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.20 per lb, nom. f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $5. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. New York basis, add 0.50. High grade, 14.85; special high grade, 15.25 deld. Die casting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50 deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $10 per lb; reactor grade, $14-$22 per lb, depending on quantity. Powder electronics grades, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.25-30.00; No. 12 foundry alloy (No. 2 grade), 23.00-23.50; 5% silicon alloy, 0.60 Cu max, 24.75-26.25; 13 alloy, 0.60 Cu max, 24.75-26.25; 195 alloy, 23.00-26.50; 108 alloy, 23.00-23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.50; grade 2, 22.00; grade 3, 21.25; grade 4, 20.75.

Brass Ingot: Red brass, No. 115, 35.00; tin bronze, No. 225, 46.00; No. 245, 41.50; high-leaded tin bronze, No. 305, 38.50; No. 1 yellow, No. 405, 27.50; manganese bronze, No. 421, 30.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 3000 to 5000 lb; nominal 1.9% Be alloy). Strip, $1.86-$1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.88, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 41.35¢; l.c.l., 41.98. Weatherproof, 30,000-lb lots, 40.78; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.68; l.c.l., 49.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheet and strip, $11.00-$14.75; sheared mill plate, $9.25-$11.25; wire $8.50-$11.00; forging billets, $6.85-$7.10; hot-rolled and forged bars, $7.10-$7.35.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $13.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	108	133
Strip, C.R.	124	108	133
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	304

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.80
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.60-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	58.4	62.5

*24-48 in. widths or diam, 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.60
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
1.125-1.500	55.20	53.90	59.00	56.10
Rolled				
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size(in.)		Nom. Pipe Size(in.)	
¾	$18.45	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.90-47.50	61.50-65.80
12-14	46.20-47.70	62.20-66.80
15-17	46.40-48.30	63.50-68.50
18-20	47.00-48.80	65.50-71.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.0, 93.30. Thread plate, .188 in., 71.70; .250-2.0 in., 70.60; Tooling plate, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.80-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 8.50-9.50; borings and turnings, 7.00-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	58.13b	55.38c	....	58.32	32.000	32.000	31.250
Yellow Brass	50.19	49.17d	50.73	53.10	24.625	24.375	22.625
Low Brass, 80%	53.40	53.34	53.94	56.21	27.375	27.125	26.625
Red Brass, 85%	54.54	54.48	55.08	57.35	28.500	28.250	27.750
Com. Bronze, 90%	56.23	56.17	56.77	58.79	29.500	29.250	28.750
Manganese Bronze	57.88	51.98	62.22	....	23.000	22.750	22.250
Muntz Metal	52.19	48.00	....	....	23.125	22.875	22.375
Naval Brass	54.14	48.45	61.20	57.55	23.000	22.750	22.250
Silicon Bronze	62.44	61.63	62.48	64.61	31.250	31.000	30.250
Nickel Silver, 10%	66.66	66.99g	66.99	....	30.875	30.675	15.438
Phos. Bronze, A 5%	77.25	77.75	77.75	79.18	33.000	32.750	31.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.50; crankcases, 8.50-9.50; industrial castings, 8.50-9.50.

Copper and Brass: No. 1 heavy copper and wire, 26.50-27.00; No. 2 heavy copper and wire, 25.00-25.50; light copper, 22.50-23.00; No. 1 composition red brass, 24.00-24.50; No. 1 composition turnings, 23.00-23.50; yellow brass turnings, 14.00-14.50; new brass clippings, 21.00-21.50; light brass, 14.50-15.00; heavy yellow brass, 16.00-16.50; new brass rod ends, 18.50-19.00; auto radiators, unsweated, 17.50-18.00; cocks and faucets, 18.50-19.00; brass pipe, 19.00-19.50.

Lead: Heavy, 12.50-13.00; battery plates, 6.50-6.75; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 14.50.

Monel: Clippings, 75.00-90.00; old sheets, 70.00-80.00; turnings, 70.00-80.00; rods, 75.00-90.00.

Nickel: Sheets and clips, 140.00-185.00; rolled anodes, 140.00-185.00; turnings, 125.00-160.00; rod ends, 140.00-185.00.

Zinc: Old zinc, 4.50-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 2.50-3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.50-18.00; 3003 clippings, 17.50-18.00; 6151 clippings, 17.50-18.00; 5052 clippings, 17.50; 2014 clippings, 16.50-17.50; 2017 clippings, 16.50-17.50; 2024 clippings, 16.50-17.50; mixed clippings, 16.50-17.00; old sheets, 14.50-15.25; old cast, 14.50-15.25; clean old cable (free of steel), 17.00-17.50; borings and turnings, 14.75-15.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 58.00; light scrap, 54.00; turnings and borings, 38.00.

Copper and Brass: No. 1 heavy copper and wire, 29.75; No. 2 heavy copper and wire, 28.25; light copper, 26.00; refinery brass (60% copper) per dry copper content, 26.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 29.75; No. 2 heavy copper and wire 28.25; light copper, 26.00; No. 1 composition borings, 26.00; No. 1 composition solids, 26.50; heavy yellow brass solids, 18.50; yellow brass turnings, 17.50; radiators, 20.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 54.79; oval 53.92, 5000-10,000 lb; electrodeposited, 45.75; 2000-5000 lb lots; cast, 48.94, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab; less than 200 lb, 120.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 30.25, over 10,000 lb, 29.50.

Copper Cyanide: 100-1000 lb, 80.50.

Copper Sulphate: 500-1900 lb, 21.15; 2000 lb and over, 18.65.

Nickel Chloride: 10 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. Prices eastern delivery.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.35. Prices eastern delivery.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 79.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more 64.20.

Stannous Chloride (anhydrous): Less than 25 lb, 169.60; 25 lb, 134.60; 100 lb, 119.60; 400 lb, 117.10; 5200-19,600 lb, 104.90; 20,000 lb or more, 92.70.

Stannous Sulphate: Less than 50 lb, 132.20; 50 lb, 102.20; 100-1900 lb, 100.20; 2000 lb or more 98.20.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

(Concluded from page 127)

shipping in 1956, reports Vice Admiral Lyndon Spencer, president, Lake Carriers' Association, Cleveland.

Cargoes of iron ore, coal, grain and limestone amounted to 192,277,991 net tons, third highest in history. This compared with 193,758,780 in 1955.

The iron ore movement, including shipments from Labrador and Picton, Ont., ranges, totaled 80,195,929 gross tons, against 89,169,973 the year preceding. Shipments from the two Canadian ranges increased to 2,279,709 tons and 283,193 tons, respectively. The Lake Superior ore shipments amounted to 77,633,027 tons.

Limestone cargoes set a new high at 30,753,412 net tons. Coal shipments rose to 57,374,685 net tons. The grain movement amounted to 14,330,454 net tons.

Bethlehem Steel Co. will begin shipping manganese ore from a mine in the Amapa territory in Brazil shortly. The company has built 120 miles of railroad from the mine to the shipping port.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 123

Production of coke in the U.S. decreased 3 per cent in November to 6,535,843 net tons, reports the Bureau of Mines. Of the total, 6,328,368 tons were oven coke and 207,475 tons, beehive.

In the calendar year to the end of November, output amounted to 67,547,289 tons, of which 65,320,660 tons were oven coke, and 2,226,629 beehive. In the like period of 1955, output totaled 68,419,500 tons, of which 66,933,300 tons were oven coke, and 1,486,200 tons were beehive.

Producers' stocks of oven coke

MOTORS—GENERATORS
TRANSFORMERS
NEW—REBUILT
WORLD'S LARGEST INVENTORY
ELECTRIC EQUIPMENT CO.
Phone Station Collect GL 3-6783
P. O. Box 81 Rochester, N. Y.

CLASSIFIED

Help Wanted

STAINLESS STEEL METALLURGIST for Technical Service B.S. degree in metallurgy or equivalent. Five to ten years mill processing, laboratory and customer contact work on stainless steels with emphasis on strip. Should have good appearance and good personality and be willing to travel. Forward complete information including employment history, education, and salary requirement to R. D. Crissman, Staff Assistant—Employment, UNIVERSAL-CYCLOPS STEEL CORPORATION, Bridgeville, Pennsylvania.

SALESMAN TO HANDLE CONTRACT ACCOUNTS for fabricated structural steel, miscellaneous metals, and reinforcing steel. Previous experience in estimating and sales preferred. Qualified persons reply to Orleans Materials and Equipment Company, Inc., P.O. Box 87, New Orleans 6, Louisiana.

Position Wanted

INDUSTRIAL ENGINEER CONSULTANT, management and production functions. By spending a small portion of my time at your plant I can train one of your men at a nominal fee. Vicinity of Baltimore. Write Box 507, STEEL, Penton Bldg., Cleveland 13, Ohio.

POSITION WANTED: STEEL PLATE FABRICATOR 15 years experience in all operations including machine shop, engineering, estimating production sales management and shop operations. Heavy experience in large structures. Will locate, now available. Box 506, STEEL, Penton Bldg., Cleveland 13, Ohio.

PITTSBURGH REPRESENTATION

Penna., Ohio, W. Va., calling oil, chemical, steel, aluminum, food industries, youthful, aggressive, excellent personality, appearance, top level experience, finest references. Write Box 502, STEEL, Penton Bldg., Cleveland 13, Ohio.

STAFF ENGINEERS

Kaiser Steel's multi-million dollar expansion program has created permanent openings in Plant Engineering Department at our Fontana plant.

Attractive staff engineering assignments available on large construction program involving rolling mills and steel making facilities.

Send resume including salary requirements to

Employment Manager
KAISER STEEL CORP.
P. O. Box 217
Fontana, California

ELECTRICAL ENGINEER

Welded Steel Tubing, Northeast Ohio. To reduce electrical down time production, maintenance equipment to a minimum. Establish preventive electrical maintenance program.

Reply Box 503, STEEL
Penton Bldg. Cleveland 13, Ohio

TOOL ROOM FOREMAN

Welded Steel Tubing, Northeast Ohio. Supervise Tool Room. Assist in developing and administrating a program to eliminate mechanical down time on production and maintenance equipment.

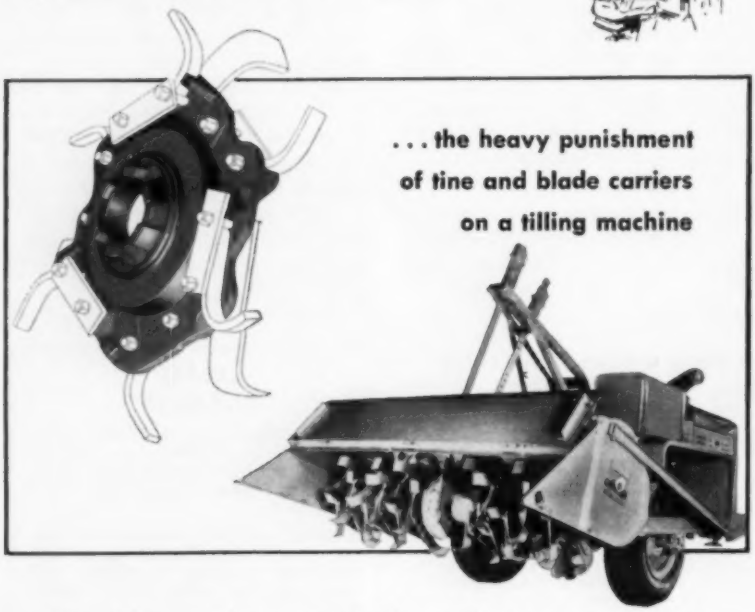
Reply Box 504, STEEL
Penton Bldg. Cleveland 13, Ohio

Sales Representative Available

Rolling Mill Equipment—Steel Plant Supplies
Pittsburgh Tri-State Area
Address Box 505, STEEL
Penton Bldg. Cleveland 13, Ohio

How about Malleable?

It's the solution to many problems like this one



. . . the heavy punishment of tine and blade carriers on a tilling machine

The ability to take *tough going* has to be built into any soil working equipment. Malleable Iron plays an important part throughout the industry because toughness is its middle name!

In the Seaman Tiller shown above, over 1000 pounds of Malleable castings are used in each machine—in the carriers, transmission cases, torque tube brackets and other heavy-duty parts.

"Whether tilling heavy soil in California or stony fields in New England, our tillers with their tough malleable carriers stand up in service"—is the way Seaman Motors, Inc. of Milwaukee expresses it.

That describes the *end* result. Of equal interest to the *manufacturer* are the many processing and cost advantages that Malleable Iron has to offer. It will pay you to consult your nearest malleable foundry, or write to this Society for information.

Malleable FOUNDERS' SOCIETY

1800 Union Commerce Building Cleveland 14, Ohio

at the end of November totaled 2,439,141 tons, equal to 11.6 days' output.

Following the lead of midwestern producers, oven foundry coke makers in the East have advanced prices $1 a ton to $29.50 at Philadelphia, Camden, N.J., and Swedeland, Pa., and to $30, Kearny, N.J.

Plates . . .

Plate Prices, Page 115

Granite City Steel Co., Granite City, Ill., has followed action of other producers and revised upward its list of extras on carbon plates. The increase: 4 to 5 per cent.

Of all the major steel products, plates are in shortest supply. The scarcity is holding back manufacturing in various fields, and prospects are not promising for early improvement in conditions. Bethlehem Steel Co. will suspend plate production at its Sparrows Point plant on Feb. 1 for expansion of facilities. Supply promises to become more critical than it has been in recent years.

In all major consuming lines—tanks, line pipe, freight cars, ships, heavy building and mill equipment—requirements are running well in excess of supplies.

Sufficient tonnage will be available for freight cars at the rate of 6000 units monthly, at least for the next several months. This is because of the relief afforded through increased plate production on the strip mills, with demand for strip and sheet lagging.

How much plate tonnage will be diverted to shipbuilding is uncertain, but shipbuilding requirements are rapidly mounting. For example, in the Philadelphia area alone the Sun Shipbuilding Corp. has nine tankers on order. At the same time, the New York Shipbuilding Co. has orders for six tankers. These ships will require 180,000 tons of hull steel, chiefly plates. Most of the tonnage remains to be placed.

In this connection, it is significant that steel set-asides for second quarter on defense account have been upped 2 per cent to 561,619 short tons.

Kaiser Steel Corp., Oakland, Calif., raised plate prices (carbon, alloy and high-strength low-alloy) $1 a ton, effective Jan. 11.

Advertising Index

Acme Chain Corporation 54
American Steel & Wire Division, United States Steel Corporation 15
Anaconda Wire & Cable Co. 11
Armco Steel Corporation 32

Baltimore & Ohio Railroad 46
Bethlehem Steel Co. 1, 136
Bliss, E. W., Co. 8
Borg-Warner Corporation, Industrial Crane & Hoist, Ingersoll Products Division 109
Browning, Victor R., & Co., Inc. 126
Buffalo Forge Co. 24
Bullard Co., The 48

Cattie, Joseph P., & Brothers, Inc. 126
Century Electric Co. 84
Chambersburg Engineering Co. 129
Cincinnati Gear Co., The 55
Cleveland Cap Screw Co., The 22
Cleveland Worm & Gear Co., The ..... Inside Back Cover
Cold Metal Products Co., The 31
Colorado Fuel & Iron Corporation, The 94, 95, 101
Columbia-Geneva Steel Division, United States Steel Corporation 15
Columbia Tool Steel Co. 119
Continental Tool Works, Division of Ex-Cell-O Corporation 6
Copperweld Steel Co., Ohio Seamless Tube Division 104
Copperweld Steel Co., Steel Division 51
Corhart Refractories Co., Inc. 102
Crucible Steel Company of America 19
Cutler-Hammer, Inc. ..... Back Cover

Deming Co., The 110
Dempster Brothers 18
Dravo Corporation 97

Eastern Machine Screw Corporation, The 126
Electric Controller & Mfg. Division of Square D Co. ..... Inside Front Cover
Electric Equipment Co. 133
Ex-Cell-O Corporation 7
Ex-Cell-O Corporation, Continental Tool Works Division 6

Fairchild Engine & Airplane Corporation 131
Fenn Manufacturing Co., The 10

Goodyear Tire & Rubber Co., Inc., The, Industrial Products Division 4

Hamilton Foundry & Machine Co., The 23
Harco Corporation, The 106
Harris Foundry & Machine Co. 64
Hill Acme Co., The 27
Hunter Spring Co. 12

Industrial Crane & Hoist, Ingersoll Products Division, Borg-Warner Corporation 109

Kaiser Steel Corporation 133
Kling Bros. Engineering Works 3

LeBlond, R. K., Machine Tool Co., The 80, 81
Leeds & Northrup Co. 17
Lord Baltimore Hotel, The 127

McKay Machine Co., The 43

Malleable Founders' Society 134
Manning, Maxwell & Moore, Inc., Shaw-Box Crane & Hoist Division 120
May-Fran Engineering, Inc. 98, 99
Monarch Machine Tool Co., The 112

National Acme Co., The 13
National Automatic Tool Co., Inc. 20, 21
National Steel Corporation 83
National Tube Division, United States Steel Corporation 15

Ohio Seamless Tube Division of Copperweld Steel Co. 104

Palmer-Shile Co. 89
Peters-Dalton, Inc. 59
Peterson Steels, Inc. 100
Pittsburgh Engineering & Machine Co., Division of Pittsburgh Steel Foundry Corporation 77

Remington Rand Division of Sperry Rand Corporation 114
Republic Steel Corporation 86, 87
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 101
Rust-Oleum Corporation 44
Ryerson, Joseph T., & Son, Inc. 34

Scioky Bros., Inc. 91, 92
Sharon Steel Corporation 61
Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore, Inc. 120
SKF Industries, Inc. 9
Sperry Rand Corporation, Remington Rand Division 114
Square D Co., Electric Controller & Mfg. Division ..... Inside Front Cover
Sun Oil Co., Industrial Products Department 25, 26
Surface Combustion Corporation 125

Tennessee Coal & Iron Division, United States Steel Corporation 15
Texas Co., The 28
Thomas Flexible Coupling Co. 107
Timken Roller Bearing Co., The, Steel & Tube Division 52
Tinnerman Products, Inc. 56
Torrington Co., The, Specialties Division 66

Ulbrich Stainless Steels 16
United States Rubber Co., Mechanical Goods Division 75
United States Steel Corporation, Subsidiaries 15
United States Steel Export Co. 15
United States Steel Supply Division, United States Steel Corporation 15

Wean Engineering Co., Inc., The 63
Webb Corporation, The 108
Weirton Steel Co. 83
Wheelabrator Corporation 14
Wheland Co., The 16
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 94, 95

Youngstown Sheet & Tube Co., The 2

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 133

Cancer can't strike me, I'm hiding.

What I don't know won't hurt me.

Cancer?

Lots of people die of it, I know . . . but the American Cancer Society says a great many deaths from cancer are NEEDLESS deaths. That's why I do what they tell me. I have an annual medical checkup however well I feel. I know the seven danger signals. And when I want sound information, I get it from my Unit of the

AMERICAN CANCER SOCIETY

Sharp eyes follow your Bethlehem drop forging

No need to point out that the making of a good drop forging requires sharp eyes. But at Bethlehem, we like to feel that the eyes are a little sharper than usual. That's just a way of saying every operation is watched with particular care.

It's the type of care that begins at the furnaces, where the steel is made, and is evident in all the successive steps of rolling, forging, heat-treating, cleaning, and inspection. And throughout the entire process our metallurgical watchdogs are always on the job, continually checking such matters as analysis, hardness, etc.

Bethlehem offers a thoroughly integrated set-up, one that produces a huge variety of drop-forge designs. Every aspect of the service is strictly first-class. If care and alertness are extras that you value, it will be to your advantage to call us.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Six of nine Cleveland Worm Gear Drives in use on the Anvil Lift Drive of this Mesta Gag Press are in view.

Gag press uses 9 CLEVELAND drives to straighten steel

BIG equipment . . . doing a big job. Smooth, powerful, dependable speed transmission is vital here—and this gag press, designed and built by Mesta Machine Company, has it . . . thanks to 9 Cleveland Worm Gear Drives.

Cleveland Worm Gearing—the dependable drive—affords exceptional advantages for practically any power job. Steel worm on bronze gear provides the best possible medium to transmit power with minimum friction and wear—reduces motor speed evenly, efficiently and quietly. Right angle drive makes a worm gear reducer compact and rugged, with few moving parts. And when it's a Cleveland, you get extra benefits from 44 years of experience concentrated on making worm gear drives.

Get the full Cleveland story on power transmission. Write for Catalog 400; ask for technical advice on any problem you may have. Then, you'll specify Cleveland Worm Gear Drives. The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

★ ★ ★

This Safety Switch is Built to Match the Performance of the Finest in Motor Control

☆ *installs easier*

☆ *works better*

☆ *lasts longer*

A Safety Switch Worthy of its Name
Cutler-Hammer 4105. Type A. 30 to 1200 Amp.

Engineered for "heat-proof" dependability. New design for minimum internal heat generation; new materials for heat immunity.

Automatic pressure fuse receivers; no screws to forget to tighten . . . no screws to loosen in service by alternate expansion and contraction.

Visible blades for quick and sure inspection at all times. New double insulated steel operating hook. Safety is important in safety switches.

Panel mounted mechanism of the Cutler-Hammer 4105 Safety Switch is readily interchangeable with that of the Cutler-Hammer 4101 to permit replacements without case and conduit work.

Cutler-Hammer Three-Star Motor Control performance has proved sensational wherever and whenever it has been compared with any other control equipment. A kaolin processing plant in Georgia, for example, reports: "Because of the hard service we give motor control in our plant, we have always had to replace contacts every 30 to 60 days. Our first Three-Star Control has now been in daily use for *thirteen months* and its original contacts still look and perform like new." A lumber mill in California says: "Control contacts have always been a problem on our drive of the feed chain going to the trim saw. We had to replace contacts every few weeks. Your Three-Star Control is now in its *twenty-fourth month* of continuous daily operation with the original contacts still in service."

Such control equipment brings important dependability and savings to any job. But it should be matched with a safety switch designed and built to equal the performance. That is exactly what the Cutler-Hammer 4105 Safety Switch offers. It is loaded with advanced design features. See it. Try it. Prove it. Order from nearby Cutler-Hammer Distributor today. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto.

CUTLER-HAMMER
★ ★ ★
MOTOR CONTROL
C-H

Cutler-Hammer Three-Star Motor Control can now be obtained in every needed form

Cutler-Hammer Authorized Distributors carry stocks of Three-Star Motor Control in sizes and types of enclosures to meet all the usual industrial needs.

Leading machinery builders equip their machines with Cutler-Hammer Three-Star Motor Control as standard original equipment, often as components on panels.

The new Cutler-Hammer Three-Star Unitrol provides for the quickest installation or rearrangement of the finest in control equipment, C-H Three-Star Motor Control.